BEST: The Maori canoe.

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NEW ZEALAND.

DOMINION MUSEUM.

BULLETIN No. 7.

THE MAORI CANOE.

An Account of Various Types of Vessels used by the Maori of New Zealand in Former Times, with some Description of those of the Isles of the Pacific, and a Brief Account of the Peopling of New Zealand.

By ELSDON BEST.

Published under the direction of the Board of Maori Ethnological Research, for the Dominion Museum.

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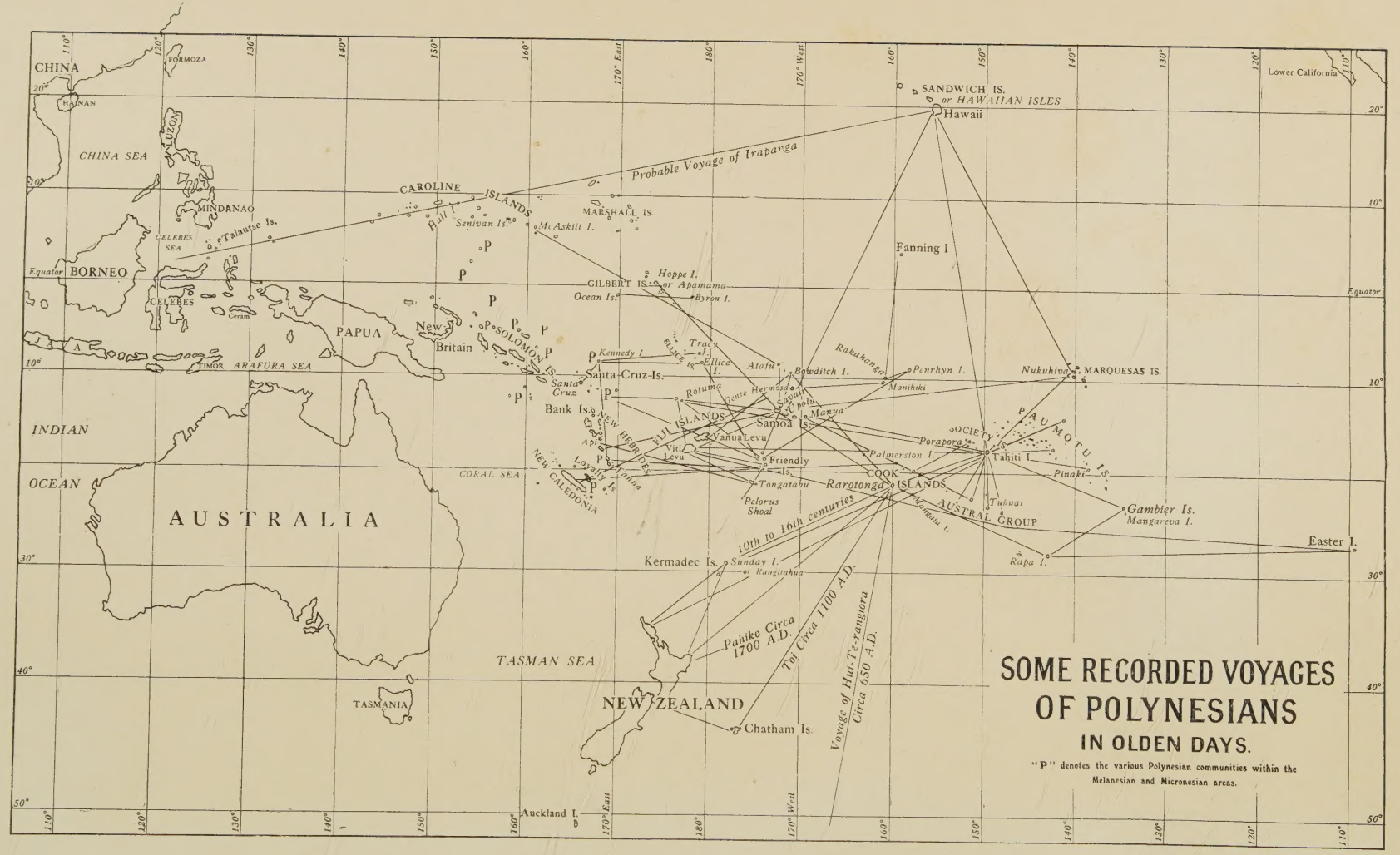

SOME RECORDED VOYAGES OF POLYNESIANS IN OLDEN DAYS.

"P" denotes the various Polynesian communities within the Melanesian and Micronesian areas.

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MUSEUM BULLETIN No. 7.

THE MAORI CANOE.

PART I.

INTRODUCTORY REMARKS.

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The Polynesian canoe. Canoes of New Zealand. Obsolete types. Paucity of information. Nomenclature. Canoe-structure changed by local conditions. Possible origin of local peculiarities. Principal forms not peculiar to New Zealand. Symbolical terms for canoes. The canoe of Tama-rereti. Ownership of canoes.

THE vessels of Polynesia and their manipulation form one of the most interesting subjects connected with the Pacific area. Not only are the various types of interest in regard to their structure, origin, and modes of use, but what specially appeals to the imagination is the fact that in these vessels the ancestors of the Polynesian peoples performed voyages of amazing length, and explored vast areas of the Pacific Ocean.

So intimately connected is the *waka maori*, or native vessel of New Zealand, with kindred forms in Polynesia and other regions of the great island system, that it has been found necessary to extend our purview to those areas, and to give some account of such allied forms. This is doubly necessary to throw light on certain types of vessels formerly used by the Maori of New Zealand, but which have gone out of use since the visits of Captain Cook to these shores. This extension of our subject will also tend to show how the Maori of former times navigated the Pacific, how he discovered and settled far-separated isles, and how he found his way to New Zealand. A description of the Maori canoe and its management must include some explanation of native methods in the prosecution of deep-sea voyages. Many of the most interesting illustrations of such undertakings occurred at a period prior to the peopling of New Zealand by Polynesians. The Maori of these isles are Polynesians who have been isolated for about five centuries, but have preserved some interesting traditions concerning the long voyages made by their ancestors, including some from eastern Polynesia to New Zealand.

We thus commence with the knowledge that the natives of these isles are a section of the Polynesian race occupying the far-spread island system from New Zealand northward to the Sandwich Isles, and from Easter Island westward to the eastern bounds of Melanesia and Micronesia. Melanesia extends as far eastward as the 180th degree of longitude, at the Fiji Group. North and south of that group the Polynesian area reaches farther west, and outlying posts of this adventurous people are found far within Melanesia and Micronesia. All these far-sundered units of the Polynesian race speak dialects of a common tongue. The Maori of New Zealand represents one of these units; his vessels were those of Polynesia, modified to some extent in later times.

The old type of Maori, the type that preserved the traditions of the doings of the seafarers of yore, and loved to dwell thereon, was much given to discoursing upon the *ara moana*, or "sea-roads," which were traversed in past centuries. These traditions tell us of long voyages made in far-off times, often with mythical accretions, of strange lands and strange people encountered by dauntless voyagers of yore. They tell of the rolling sea-roads

that lead from the revered mother-land to the red sunrise, and of how the men of old followed them ever eastward through the island system. They explain the signs by which the coming storm was known, and how the vessels were prepared to meet it. They show us the sea discipline of a race of courageous explorers, the methods by which trained men overcame the perils of the ocean, and how the old Polynesian sea-rovers laid down the water-roads across the broad breast of Hine-moana for all time. For these were the men of whom it might be written—

> There to burst all links of habit,
> And to wander far away
> On from island unto island
> At the gateways of the day.

The description of Maori canoes and their management, including methods of navigation formerly employed by the natives of these isles, is by no means an easy task at the present time. Some types of vessels used by former generations have long since been discarded, and no description of them was ever recorded by early visitors to these shores. These were the double canoe, and the single canoe provided with an outrigger, concerning which it is difficult to obtain any reliable information. The same remark applies to canoe-sails and to certain other matters. Very few natives now living possess any knowledge of the management of canoes at sea, for sea voyages have long been abandoned. Coastal voyages were given up many years ago, and sea-fishing from canoes has been discontinued. Nothing remains save the use of a few canoes on river and lake, such as is seen on the Whanganui River. It is probably a fact that we have a more detailed account of the fittings and management of the deep-sea vessels used by the ancestors of the Maori five centuries ago than of the modern type used on these shores a hundred years since. To one person alone are we indebted for detailed illustrations of the ordinary types of the Maori canoe, the French voyager D'Urville. Cook's artists and draughtsmen, with all their opportunities, neglected to give us any good series of illustrations of the three most interesting items of Maori industrial art—their canoes, forts, and superior houses.

In like manner, we find no good detailed description of the *waka maori*, or native canoe, in any of the numerous works written by early missionaries, traders, and visitors to these shores: all disappoint us. Thus it is that the writer is compelled to adopt the same course as that pursued in the compilation of a former paper, on native forts—viz., to collect such meagre accounts of the Maori canoe as have appeared in various works on the Maori, and add to them such information as has been gathered from natives directly or is embodied in oral traditions.

In regard to canoes of Polynesia we are more fortunate, and in the writings of Ellis and other early observers we find some good descriptions of the various forms of canoes employed in the isles of the Pacific. Some of these resembled certain New Zealand types, which were modified forms of Polynesian prototypes. It must be borne in mind that the Maori canoe was introduced from Polynesia; the local vessels are closely related to those of the eastern Pacific.

Of the three types of canoe used by the Maori of New Zealand, one only has been described and illustrated, the single canoe possessing no outrigger. This is the only one that has survived to the present day, and the only one of which we can give a really satisfactory description. The superior specimens of this type have indeed disappeared. Only one good hull has been preserved in our museums—that of the "Toki-a-tapiri," in the Auckland Museum; but we have details as to their fittings, and D'Urville's admirable drawings.

In his paper on the canoes of Torres Strait, Professor Haddon remarks that "Few subjects in ethnology offer a finer field of research than the many important problems connected with the morphology, modifications, and distribution of canoes." The origin and distribution of the Polynesian forms, especially those of the outrigger and double

canoes, is assuredly a subject of deep interest. The writer of this paper possesses, however, neither the knowledge nor facilities to enable him to enlarge upon these matters, but can merely give some account of Maori canoes and quote accounts of those of Polynesia, &c.

All forms of Maori canoes come under the generic term of *waka*, a term applied also to wooden troughs, boxes, and other receptacles, as also to the human medium of a spirit-god. Each form, however, had its specific name, as is shown below.

Certain writers have objected to the term "canoe" being applied to the *waka maori* of New Zealand, owing to its being inappropriate. But it is by no means a simple matter to find a more appropriate one. It is scarcely advisable to employ the native term of *waka;* and the *prau* of the western Pacific differed in form, having its lee side flat and the weather side rounded—also an outrigger. The term "pirogue," like that of "canoe," is applied to a dugout vessel. "Canoe" is also applied to vessels made of sheets of bark, though Webster's definition is "A boat used by rude nations, formed of the trunk of a tree, excavated by cutting or burning into a suitable shape." This describes a simple dugout, but does not embrace a vessel fitted with top-strakes, prow, and stern-pieces, &c., as were many Polynesian vessels, in which also the dugout hull was sometimes composed of two or three pieces. The term "canoe" is retained throughout this paper, for want of a better one, but it scarcely seems suitable.

In a paper on "The Early History of the Moriori" (natives of the Chatham Isles), written by Mr. A. Shand, occur the following remarks: "With regard to the term 'canoe' (as we call the *waka*), having in view the present-day build of such, it is certainly a misnomer, and the term 'vessel' would be more appropriate, for no canoe of the present type could, except under the most exceptional circumstances, ever have crossed the long stretch of ocean between Rarotonga and New Zealand, or New Zealand and Chatham Islands, consequently it may be accepted as an impossibilty. The word *waka*, with Maori and Moriori, embraced all sizes and kinds of canoes, and it is quite certain that the vessels in which they made their long Pacific voyages were not of the present type."

Presumably Mr. Shand had the inferior craft of the Chatham Isles in his mind when he wrote the above lines, for the larger craft of New Zealand might have served as vessels for deep-ocean voyaging. In order, however, to so use them it would have been necessary to provide them with an outrigger, or to have formed them into double canoes.

It is not safe to assume that the vessels that reached New Zealand were of an extraordinary size. It seems probable that larger canoes have been constructed here than any of those that arrived from Polynesia. In the case of double canoes the carrying-capacity would, of course, be much increased, though for deep-ocean voyaging these craft are said to have been more clumsy than a single vessel fitted with an outrigger. When we consider the skill and daring of the old Polynesian voyager, it is not necessary to imagine a "Toki-a-tapiri," 83 ft. in length, as bringing the Maori to these isles. The Maori of former times was quite capable of crossing the ocean—say, from Rarotonga hither—in vessels of 60 ft. to 70 ft. in length. The canoe known as "Te Heke Rangatira," now in the Dominion Museum, is a specimen of the second class of Maori vessels, fitted with top-strakes and used in sea-fishing and coastal voyages, as also in war expeditions. Its dugout hull is 46 ft. long, width (inside measurement) 4 ft. between top-strakes, and depth a little over 2 ft. This craft would accommodate at least twenty men on a sea-fishing trip, and in the event of a sudden squall her crew would bring her safely to land through a rough sea in a manner hereinafter described. Many drift voyages of hundreds of miles have taken place in the Pacific in smaller vessels than the "Heke Rangatira."

When Polynesian voyagers settled in New Zealand they found here forests containing huge trees suitable for canoe-making, hence they were enabled to hew out hulls of great size that needed but a single side-plank to convert them into sea-going vessels.

In many of the groups of Polynesia no such large trees were procurable; and we know that the canoes of Tahiti seen by Cook and his companions were composed of shallow dugout hulls, with built-up sides consisting of a series of planks lashed on one above another. It is possible that bigger timber was obtainable in those parts at the time when the ancestors of the Maori left that region. Vessels of greater beam than any hitherto made may have been employed here, owing to the great girth of our forest-trees, and this may have led to the gradual abandonment of the outrigger by the Maori. Possibly some minor changes in structure took place here, but nevertheless it is doubtful if the vessels that reached these isles from the eastern Pacific long centuries ago differed much from those seen here by Tasman, Cook, and other early voyagers. These navigators found here the double canoe, the single canoe fitted with an outrigger, and the single canoe without that aid. Add an outrigger to the larger Maori canoe fitted with top-strakes and you have an ocean-going vessel. All these types are found in various regions of the Pacific. There is no need to imagine another type to bring the Maori to New Zealand.

In connection with the form of Maori canoes, and the differences shown therein from some of the Polynesian craft, there is one possible origin for such differences that has not been treated of. We are told in Maori tradition that when their ancestors from eastern Polynesia reached New Zealand they found the Mouriuri (or Maruiwi) aborigines in possession of objects made of greenstone (nephrite). In order to obtain this stone they must have possessed the art of making canoes capable at least of crossing Cook Strait. Of what form were those canoes? Unfortunately, tradition is silent on that subject. It is, however, quite possible that canoes constructed by the mixed descendants of the aboriginal Maruiwi and Polynesians—that is, by the Maori—differed from eastern Polynesian forms, on account of being modelled to some extent on aboriginal forms. There is in the Dominion Museum a model of an outrigger canoe of Woodlark Island, off the New Guinea coast. In this model the carved figurehead and high carved stern-piece resemble Maori forms more than those of any Polynesian canoe we know of. In both these objects we see the curvilinear designs that are so marked a feature in Maori carvings, and for which we look in vain to Polynesia.

In a lecture on "Maori Superstitions" delivered by Mr. J. White in Auckland about the year 1863 occurs the following remark: "The present canoe is called *waka*, the model of which is said to have been taken from the dry seed-pod of the *rewarewa* (*Knightia excelsa*, New Zealand honeysuckle). Those who may desire to see how minutely the model has been followed will, on comparing them, observe that even the figurehead and the projecting piece over the stern have been copied." No more misleading remark could be made than the above, for it gives a reader the impression that the Maori canoe represents a distinct type, of local origin, whereas vessels of similar form are found in other parts of the Pacific.

Canoes are referred to in Maori song and story as *Tane-mahuta* and *Te Riu o Tane-mahuta*. This is because Tane (the "Fertilizer" in Maori myth) bears the name of Tane-mahuta as the progenitor of trees, and from trees are canoes made. The expression *Te Ara tauwhaiti o Tane* is also applied to them, and may be rendered as "the narrow way of Tane." The word *ara*, meaning "pathway," &c., is also applied to the means of travelling or moving. The term *waka* is likewise used in a peculiar manner sometimes as meaning a means of conveyance. An old native once remarked to the writer, "Now, if we had a *waka pakeha* [European canoe] such as you call a buggy, we could soon reach our destination."

In Maori myth the origin of canoes is explained by a story that, in times long passed away, one Hautu-te-rangi amused himself by floating shells on water and placing small stones therein, whereupon his father made for him a small wooden vessel, and thus a rude form of dugout canoe was evolved.

The first canoe of which we have any note in Maori tradition was named "Uruao," and this vessel is said to have been commanded by one Tama-rereti, who made a voyage of exploration in her in remote times. No particulars are given in the tradition, and possibly the whole story is a myth. The name of Te Waka o Tama-rereti (The Canoe of Tama-rereti) is applied by the Maori to a constellation, generally given as Scorpio by writers on native lore. Among the Tuhoe Tribe, however, the name is applied to the Tail of the Scorpion; while the curved row of stars near it, including Antares, is known as Te Waka o Mairerangi (The Canoe of Mairerengi). Some interesting notes on the "Uruao" canoe are given in volume 22 of the *Journal of the Polynesian Society*, at page 18. The explanation given in the Rev. R. Taylor s work, *Te Ika a Maui*, of the position of the Canoe of Tama-rereti in the heavens is impossible. Another old myth tells us that in Tama-rereti's vessel "Uruao" the stars were placed so as to protect them, lest they be jostled by their two elders, the Sun and Moon, and so fall from the breast of Rangi, the Sky Parent.

The vessels by which the ancestors of the Maori left their old-time father-land are said in tradition to have been provided with top-strakes sewn or lashed on to the hulls. The names of vessels by which the Maori reached New Zealand have been preserved in tradition, as also interesting particulars concerning them.

It is well to explain at this stage that ordinary canoes were, among the Maori folk, held to be almost public property; hence the old-time saying, "*He waka eke noa*," meaning that a canoe may be used by any one. Thus a canoe made by members of a family group would be used by all members of that group, each of whom would speak of it as "my canoe." An individual might dub out a small canoe for his own use, but his relatives would certainly make use of it. In regard to a bigger and finer vessel, such as a war-canoe, the head chief might be spoken of as its owner, but this would be a complimentary allusion—it really belonged to the village community. It might even be cut up and used as a mortuary memorial of that chief when he died; but this would be done by consent of the people, as a token of respect to their deceased leader.

In Maori myth the ocean is personified in Hine-moana, the Ocean Maid; but one Kiwa is the guardian of all seas, and his realm is termed *Te Moana nui a Kiwa* (The Great Ocean of Kiwa). Tangaroa is the origin and tutelary deity of fish, while Tangaroa-whakamau-tai and Rona-whakamau-tai control the tides, the latter being also the conductor of the moon. Kaukau is another of the beings controlling the ocean. The ocean is sometimes alluded to as *Tahora nui atea*, *Marae nui atea*, and *Mahora nui atea*—expressions that denote a vast open expanse. It is termed the *Marae o Hine-moana* (or the plaza of the Ocean Maid), *Marae roa*, and *Tahua roa*. *Tahua* and *marae* have a similar meaning, hence *marae roa* equals *tahua roa*. The meaning of "courtyard," usually assigned to *marae*, and often to *tahua*, is a restricted local usage. Rongo-marae-roa is "Rongo of the vast ocean expanse."

FISHING-CANOE, LACKING FITTINGS.

PART II.

CLASSIFICATION AND DESCRIPTION OF MAORI CANOES.

CONTENTS.

Three main types of canoes. (1.) The double canoe. (2.) The single canoe with outrigger. (3.) The single canoe with no outrigger. Subdivision of class 3. (A.) The *waka taua*. (B.) The *waka tete*. (C.) The *waka tiwai*. The double canoe seen by early voyagers. Tasman's remarks. Banks's remarks. Two forms of double canoe. Shortland's remarks. Missionary notes. Vessels of immigrants from Polynesia. Origin and distribution of double canoes. Late use of double canoe. The outrigger canoe. Seen by early voyagers. Origin and distribution of the outrigger. Outrigger employed in India prior to Christian era. Disuse of outrigger in New Zealand preceded that of double canoe. The double outrigger. Maori tradition of. Distribution of. Use of same abandoned in several regions. The single canoe lacking outrigger. Native names for canoes. Mohi Turei's remarks. Description of *waka taua*, or war-canoes, by early voyagers.

THERE may be said to be three main types of Maori canoes as used in pre-European times—(1) the double canoe, (2) the single canoe with outrigger, (3) the single canoe with no outrigger. Types 1 and 2 went out of use many years ago, but both were seen in Cook's time, and the double canoe was seen in the South Island coasts by early European settlers as late as the "thirties" of last century.

1. *The Double Canoe.*—There appear to have been two forms of this kind of craft in former times. One of these was a permanent type, two canoes from 1 ft. to perhaps 3 ft. apart being connected by cross-beams securely lashed; the other consisted of two vessels connected together in a more temporary manner for a coastal voyage or fishing excursion. Two canoes were also temporarily united for other purposes, such as the raising of sunken logs. Such a vessel was called a *taurua*. Mr. Stowell furnishes a note concerning a type in which the two canoes were close together.

2. Of the single canoe furnished with an outrigger we find no details in the works of early voyagers. They seem to have fallen into disuse before the abandonment of the double canoe.

3. We now come to the single canoe used without an outrigger, the one type that has survived and is familiar to us, it being still in use to a limited extent, and some specimens are also to be seen in our museums, notably the fine hull of the "Toki-a-tapiri" in the Auckland Museum. This type is usually divided into three classes, as follows:—

(A.) The *waka taua*, or *waka pitau*.—The finest type of Maori canoe, often of great size, and used in war expeditions and coastal voyages. Much adorned with carved work, painting, and arrangements of feathers, the prominent features being highly carved prow and stern-pieces. Usually termed a "war-canoe" by Europeans. The dugout hull might consist of one, two, or three pieces, a top-strake being added.

(B.) The *waka tete*.—A canoe with a plain figurehead and sometimes an inferior stern-piece. Usually smaller than a *waka taua*, and used in coastal voyages and for sea-fishing. Furnished with thwarts, top-strakes, and rough floor-like grating, as the A class was. The dugout hull might consist of more than one piece, or, like A, be hewed from a single tree.

(C.) The *waka tiwai*.—Plain dugout hulls, usually in one piece, and lacking top-strake, thwarts, floor-grating, and adornment. Small vessels used for many purposes. The smaller forms were known as *koki*, *kopapa*, *korea*, &c.

These are the three forms of the ordinary Maori canoe, though other canoe-names were in use, and some minor differences existed, as is explained below. Having classified our canoes, we will proceed to describe them by quoting the remarks of early voyagers and others, to which will be added notes obtained in later times.

The Double Canoe.

Our information concerning this type of vessel is extremely meagre, and it is only when treating of Polynesian forms, as observed by voyagers and others, that details as to construction can be given.

The double canoe must have been in common use here at the time of Tasman's visit in 1642, for he thus writes of them in his journal: "Their boats consisted of two

Fig. 1.—Double Canoe of New Zealand.

As depicted in the account of Tasman's voyage.

long narrow prows (*prau* or *proa*) side by side, over which a number of planks or other seats were placed in such a way that those above can look through the water underneath the vessel; their paddles are upwards of a fathom in length, narrow and pointed at the end; with these vessels they could make considerable speed." Again he writes: "Having weighed anchor and being under sail, we saw twenty-two prows near the shore, of which eleven, swarming with people, were making for our ships."

These canoes were observed near Separation Point, in Massacre Bay. An old plate connected with this occurrence shows a weird-looking vessel of uncouth form, and so small that thirteen men seem to occupy all available space (fig. 1). The prow and stern

projections do not resemble any known Maori forms, neither does the general form of the vessel. The top-strake and its covering batten are shown, as also the lashing; but the picture does not inspire confidence in the artist—it is probably unreliable.

Tasman speaks of one canoe containing seventeen men as though it was a noteworthy fact. We get no further information as to canoes from his journal; he may or may not have seen the single canoe, and he does not mention the outrigger.

We have now to move forward to the date of Captain Cook's arrival on these shores, in 1769, ere we again meet the Maori canoe. In the journal of Sir Joseph Banks we find the following entry concerning a double canoe seen off Whale Island:—"November 1st: Just after nightfall we were under a small island, from whence came off a large double canoe, or rather two canoes lashed together at a distance of about a foot, and covered with boards so as to make a kind of deck." On referring to Cook's journal we find that on the 1st November he passed Whale Island, in the Bay of Plenty, and he remarks that "At 7 p.m. was close under the island, from whence a large double canoe full of people came off to us. This was the first double canoe we had seen in this country." Apparently at that time double canoes were much more numerous in the South than on the shores of the North Island. Concerning this Whale Island canoe Parkinson writes: "This canoe was double, and differed in other respects from those we had seen before."

When working down the coast north of Banks Peninsula, in February, 1770, Cook's vessel was visited by four double canoes, in which were fifty-seven men. Cook speaks of fifty or sixty natives, in five double canoes, visiting his vessel at Queen Charlotte Sound. Presumably these canoes were not large ones. This was on the 10th April, 1773. On the 3rd June a large double canoe was seen at the same sound, and the next day a similar one with twenty or thirty natives on board her. On the 7th April of the same year Cook speaks of seeing a small double canoe in Dusky Sound; it was just large enough to contain a family of eight persons. Some other natives seen in those sounds appeared to possess no canoe, but used a primitive raft consisting of two or three logs of wood tied together.

An entry in Bayly's Journal, published in McNab's *Historical Records of New Zealand*, volume 2, commences—"12 April, 1773. We were visited by eight or nine canoes, some double and some single, in which were 109 Indians. . . There was one canoe much larger than the rest, and well carved."

Forster speaks of a double canoe seen at Queen Charlotte Sound in 1773 as containing about fifty men. Of another seen at the same place he remarks: "Their double canoe was about fifty feet long, and seemed to be new; both the high stern and the head were very curiously carved with fretwork and spiral lines, as described in Captain Cook's former voyage. A misshapen thing, which with some difficulty we perceived was meant to represent a human head, with a pair of eyes of mother-of-pearl, and a long tongue lolling out of its mouth, constituted the foremost extremity of the canoe. This figure is the most common in all their ornaments, and principally in everything that relates to warlike affairs. The custom of lolling out the tongue in contempt and defiance of the enemy seems to have given rise to the frequent representations of it; the figure of their tongue forms the heads of their war-canoes."

Of the double canoe seen at Dusky Sound on Cook's second voyage (1773) Forster writes: "The canoe, which appeared to be old and in bad order, consisted of two troughs or boats joined together with sticks tied across the gunwales with strings of the New Zealand flax-plant. Each part consisted of planks sewed together with ropes made of flax-plant, and had a carved head coarsely representing a human face, with eyes made of round pieces of ear-shell."

In Anderson's account of Cook's voyages we find a few notes on Maori canoes. Of those seen at Poverty Bay in 1769 he writes: "A single tree formed the bottom of

their canoes, and the upper part consisted of two planks sewed together; these were painted red, representing many uncommon figures, and very curiously wrought." Off Portland Island seven canoes went off to the "Endeavour," and next day, farther south, nine canoes approached her. Off Cape Turnagain a number of canoes also visited the explorer's vessel. When she returned up the coast canoes went off to her from Portland Island and Gable-end Foreland. Of the double canoe seen near Whale Island Anderson remarks: "In the evening a double canoe, built after the same fashion as those of Otaheiti [Tahiti] came up." A number of canoes also went off to the vessel next morning in that vicinity. Some canoes seen farther up the coast were formed of the trunks of whole trees, rendered hollow by burning; but they were not carved, nor in any manner ornamented. Many canoes were seen at Mercury Bay, and of these also we are told "Their canoes are very indifferently constructed, and are not ornamented at all." Those seen in the Hauraki Gulf, however, are described as being well constructed, and ornamented with carved work.

South of Cape Brett seven large canoes, containing about two hundred men, went off to the "Endeavour," and these were followed by two others that were adorned with carving. On reaching the Bay of Islands the ship was surrounded by thirty-three canoes, but no remarks are made on these craft, or on those seen farther north. North of Banks Peninsula four double canoes went off to the vessel. In a summary at the conclusion of the account of the first voyage we find the following remarks on Maori canoes: "The canoes of this country are not unlike the whaleboats of New England, being long and narrow. The larger sort seem to be built for war, and will hold from thirty to one hundred men. One of these at Tolaga measured near seventy feet in length, six in width, and four in depth. It was sharp at the bottom, and consisted of three lengths, about two or three inches thick, and tied firmly together with strong plaiting; each side was formed of one entire plank, about twelve inches broad, and about an inch and a half thick, which was fitted to the bottom part with equal strength and ingenuity. Several thwarts were laid from one side to the other, to which they were securely fastened, in order to strengthen the canoes. Some few of their canoes at Mercury Bay and Opoorage are all made entirely of one trunk of wood, which is made hollow by fire; but by far the greater part after the plan above described. The smaller boats, which are used chiefly in fishing, are adorned at head and stern with the figure of a man, the eyes of which are composed of white shells; a tongue of enormous size is thrust out of the mouth, and the whole face a picture of the most absolute deformity. The grander canoes, which are intended for war, are ornamented with open work, and covered with fringes of black feathers, which gives the whole an air of perfect elegance; the side-boards, which are carved in a rude manner, are embellished with tufts of white feathers. These vessels are rowed with a kind of paddle between five and six feet in length, the blade of which is a long oval, gradually decreasing till it reaches the handle; and the velocity with which they row with these paddles is very surprising. Their sails are composed of a kind of mat or netting, which is extended between two upright poles, one of which is fixed on each side. Two ropes, fastened to the top of each pole, serve instead of sheets. The vessels are steered by two men having such a paddle, and sitting in the stern; but they can only sail before the wind, in which direction they move with considerable swiftness."

Of the natives of Queen Charlotte Sound this account remarks, "They are poor, and their canoes without ornaments."

When Cook arrived at the above sound during his second voyage ten canoes visited his vessel. At the same place one other day brought five double canoes of visitors.

Of the canoe at Tolaga referred to above as being nearly 70 ft. long Captain Furneaux wrote: "It was . . no less than sixty-eight and a half feet long, five broad, and three feet six inches high: it had a sharp bottom, consisting of three trunks

of trees hollowed, of which that in the middle was longest: the side-planks were sixty-two feet long in one place, and were ornamented with carvings, not unlike fillagree work, in spirals of very curious workmanship, the extremities whereof were closed with a figure that formed the head of the vessel, in which were two monstrous eyes of mother-of-pearl, and a large-shaped tongue; and as it descended it still retained the figure of a monster, with hands and feet carved upon it very neatly, and painted red. It had also a high peaked stern, wrought in fillagree, and adorned with feathers, from the top of which two long streamers depended, made of the same materials, which almost reached the water."

In November, 1773, Furneaux speaks of seeing six large canoes, "most of them being double ones," hauled up on the beach at some place in Queen Charlotte Sound. In Anderson's narrative of Cook's third voyage is given the following account of canoes seen in the sound: "Their boats consist of planks raised upon each other, and fastened with strong withes. Many of them are fifty feet long. Sometimes they fasten two together with rafters, which we call a double canoe: they frequently carry upwards of thirty men, and have a large head, ingeniously carved and painted, which seems intended to represent the countenance of a warrior when engaged in the heat of action. Their paddles are narrow, pointed, and about five feet long. Their sail, very seldom used, is a mat formed into a triangular shape."

The double canoes employed by the Maori were evidently two genuine open vessels, both of which were used, as for passengers. Any platform across them was evidently a minor affair, not the important thing that it was in a Tongan vessel of that class.

Captain Furneaux remarks that at one place in Queen Charlotte Sound he saw "six large canoes hauled up on the beach, most of them double ones." This was in December, 1773. Again, at Grass Cove, he saw "a very large double canoe."

Neither Cook nor Banks mentions double canoes as having been seen in the Bay of Islands district; and Crozet, who was there in 1772, is equally silent regarding them, though he describes the single canoes.

Our next note comes from Dr. Savage, who visited the Bay of Islands in 1805: "Their canoes are formed of the trunk of a fir-tree, hollowed out by the adze, and usually raised upon by a plank of a foot broad on each side: they are of various dimensions, from thirty to sixty feet in length and upwards, and from two feet six inches to more than five feet broad; sharp at each extremity, and about three feet deep, including the plank before mentioned. This plank is united to the body of the canoe by ligatures, and a quantity of rush or flax placed in the seam, so as to answer the purpose of caulking. Their war-canoes are ornamented with carving and painting, and many of them are really very handsome. These will contain upwards of thirty warriors, and they sometimes lash two of them together. Ten or fifteen of these double canoes must form a powerful fleet, and would prove formidable to a European merchant ship. The common canoes are seldom more than about thirty feet in length; these sometimes contain two families, that come off to the ship for the purpose of trade. There is usually a division in the canoe, formed of wattle, to prevent the dealings of the two families from interfering with each other. They are also provided with nets, hooks, and lines, as an almost inseparable part of their equipment. Paddles are universally made use of, and, from the great strength and activity of the natives, the canoe is impelled forward with uncommon velocity. A large stone supplies the place of an anchor."

The division in the canoe mentioned above is unknown to us, as no other writer seems to have mentioned it. The remark that "they sometimes lash two of them together" apparently implies that but few double craft were seen by the writer, and possibly that the lashing-together was but a temporary arrangement. However, Mr. H. M. Stowell (Hare Hongi), who is a member of the Ngapuhi Tribe, of the Bay of Islands district, states that two forms of double canoe were formerly employed by his folk. One of these, the

waka hourua, consisted of two canoes placed side by side, close together, and so secured. They were fitted with top-strakes. The other type, termed a *mahanga*, had the two canoes secured about 30 in. apart. When a double canoe was employed in coastal voyages one hull was often used to contain travellers' stores. Mr. Stowell also states that in his youth he saw an old *waka hourua*, both ends of which had been destroyed by fire, the width of the two canoes being 10 ft. to 12 ft.

The above form in which the two canoes were fixed close together without a space between their central parts is an hitherto-undescribed type. The term *mahanga*, also employed to denote "twins," is a word that might well be applied to a double canoe.

In an account of the troublous times in the South Island during the early part of last century, as given in *Stories of Banks Peninsula*, we note the following: "Taiaroa's fleet, which consisted of twenty-nine canoes, was mainly composed of vessels specially adapted for ocean voyaging, formed by lashing two ordinary war-canoes together, and further strengthening them with a deck."

Fig. 2.—Double Canoe of Otago.

As depicted by a member of D'Urville's staff. Sketched by Miss E. Richardson from original in Hocken Library.

(See figs. 154, 156, 158, 159, and 161 for other forms of double canoes.)

In the same work a statement made by an early settler is given: "I have seen as many as twenty canoes of fishermen go out in the morning, and they would take their double canoes outside the heads without fear of being blown off."

An early settler, Mr. James Hay, author of *Earliest Canterbury* (1915), writes: "When a boy I can well remember two double war-canoes and a large sealing-boat coming into Pigeon Bay from the North Island." This would be in the "forties" of last century.

It seems clear that the double canoe survived to a later period in the South Island than in the North, and that it was in common use there in Cook's time. Polack, who lived for some years at the Bay of Islands in the "thirties" of last century, and also voyaged down the east coast as far as Tolaga Bay, remarks that "Canoes are very rarely lashed together; during my seven years' acquaintance with the country I never saw a single instance of the kind, and no platforms are made to surmount them, as is practised by the natives of the islands of Oceanica." We see that Cook and his companions

mention but one double canoe as having been seen by them on the coast of the North Island, while they saw a considerable number in the South.

Mr. Shortland, writing in the "forties" of last century on the acquisition of whale-boats by South Island natives, says: "The large double canoes they formerly had were too valuable a property to be possessed by any but the wealthy, and required a more numerous crew for their management than a boat does; so that a great part of the population were then, as they are at the present day in the North Island, obliged to travel by land." It would appear that these double canoes seen in the South by Cook and by early settlers were indeed of a permanent type, and not merely two single craft temporarily lashed together.

The Rev. R. Taylor, author of *Te Ika a Maui*, states that "The New-Zealanders have retrograded since the days of Captain Cook; they then possessed large double canoes, decked, with houses on them, similar to those of Tahiti and Hawaii, in which traditionally their ancestors arrived; it is now more than half a century since the last was seen." There is no evidence to show that the double canoes seen by Cook had any form of house on them.

The Rev. J. Buller, author of *Forty Years in New Zealand*, states that according to Maori tradition their ancestors came to New Zealand in thirteen large double canoes, but that they did not all come at the same time. He adds: 'The canoes they had were like those of the South-Sea-Islanders of to-day. They were double canoes, and provided with outriggers." Now, in the first place, no double canoe is provided with an outrigger, for the simple reason that it is quite an unnecessary adjunct to that class of vessel. Secondly, a much greater number of canoes reached New Zealand from Polynesia than the thirteen above mentioned, and they were by no means all double canoes. Thomson, in his *Story of New Zealand*, states that the vessels "Arawa," "Tainui," "Matatua," "Takitumu," "Kurahaupo," "Tokomaru," "Matahorua," and "Aotea," that reached these isles, were all double canoes; but native tradition does not support this statement. Of "Takitumu" we have a more detailed description than of any other Polynesian vessel that reached New Zealand, and she was certainly a single canoe furnished with an outrigger, as also was "Kurahaupo." "Tokomaru" arrived here probably nearly two hundred years before the "Arawa" "Tainui" fleet, and is not described, but the three vessels that followed her under Nuku are distinctly described in tradition as being *e rua nga waka unua, kotahi te waka marohi* (two double canoes and one single canoe). "Aotea" and "Matatua" are said to have been single canoes.

It is generally asserted that the "Arawa" was a double canoe with a platform between the two hulls on which a cabin or shed was built; but, as Archdeacon H. W. Williams has pointed out, this is by no means clear in the account preserved in Sir G. Grey's *Polynesian Mythology*. In the English part we find this—"I will climb up upon the roof of the house which is built on the platform joining the two canoes"; whereas the original reads thus—"*Kia piki atu au ki runga i te tuanui o te whare nei*": hence we see that the latter part of the sentence, after the word "house," is not a translation, as it does not appear in the original. Where did the platform and the second canoe spring from? (See Grey's *Polynesian Mythology*, 2nd edition, p. 86, English, and p. 73, Maori.)

A statement occurs in volume 2 of White's *Ancient History of the Maori* that the "Arawa" was a double canoe. It was obtained from Whanganui natives, who also said that the "Arawa" was the largest vessel that reached these shores.

The term *whare* (house, or hut) may have referred to the covering often erected over the stern part of eastern Polynesian single canoes, or to the awning fixed during bad weather.

The double canoe is sometimes alluded to by natives as a *taurua;* but it would appear that this term was more especially employed in cases where the joining of two canoes

was a temporary one, the more specific terms of *waka unua* and *huhunu* denoting a permanent form.

The word *pora*, applied in New Zealand to a ship, is, in the Hawaiian (Sandwich) Isles, given to the slightly elevated platform between the two hulls of a double canoe. In Tahitian *farepora* (Maori *whare pora*) is a small thatched house or hut on a double canoe of the Paumotuan form.

Barstow considered that the use of double canoes in New Zealand waters was gradually abandoned for three reasons—(1) single canoes of large size could be made from the big timber obtainable here; (2) the unhandiness of double canoes in the rougher seas of this region; (3) the numbers of rivers, and creeks, unknown in coral islands, but common here, many of which, through narrowness, would be inaccessible to double canoes.

In his paper on "Maori Life on the Poutini Coast" Mr. H. D. Skinner shows that double canoes were used on the west coast of the South Island, apparently in recent times. In this paper we find a definite statement that the two canoes were of different lengths, one being about 10 ft. longer than the other. They were attached by means of spars lashed across them, and in the middle a platform was constructed on which a mast was erected. Natives from other parts of New Zealand used to visit their coast in canoes for the purpose of obtaining greenstone (nephrite).

The following remarks on double canoes of the South Island are taken from a paper by H. Beattie on "Traditions and Legends collected from the Natives of Murihiku," published in volume 25 of the *Journal of the Polynesian Society*:—

"Mention has been made of the double canoes. . . These were a typically southern product, as the rough seas round Otago and Foveaux Strait need security in sea-going craft. An old man described them to me. They were, he said, all double canoes in the South Island, not single ones like those of the North Island, which the people down here call *taratahi*. The name of these double canoes was *waka hunua*, or sometimes just *hunua*. They were not used in the North Island; probably there were bigger trees there, and they could get big enough single canoes. Of the double canoes, one was larger than the other, and there was a deck between, this deck being called *orauwawa*. These canoes all carried sails made of mats, and known as *ra tiaka*. The bows were called *ihu*, the figures carved thereon being *tauihu*; the sterns were called *ta*, and the carvings on them were called *whakairo*. The great advantage of these canoes was that they would not capsize; and in storms they would often lash two or three together into rafts, and ride out the storm by keeping the bows to the wind. Sometimes, in bad storms, the lashings would break, and then there was trouble and perhaps loss of life. My informant had never seen one of these canoes complete, but when he was a lad he had noticed the carvings lying about, and, being interested in all that pertained to seafaring, he asked the old men about them and learnt the particulars given above."

One might infer from the above that double canoes were not used in the North, which would be incorrect, though apparently they were scarce here even in Cook's time. The statement that all canoes used on South Island coasts were double ones is also an error. The name *orauwawa* for the platform is new to us. Mr. S. Percy Smith states that a similar canoe at Rarotonga is called *vaka orau*. The Tahitian *horahora* (= platform of the *pahi* vessels) is scarcely a comparative, and the Paumotuan *horau* may be noted as a possibility that the platform at one time supported a shed. *Tiaka* is the northern word *tianga* (a mat); *ra tianga* = mat sail.

An old whaler named Haberfield, who came to the South Island early in 1836, informed Mr. A. Bathgate that he had seen as many as a dozen large double canoes at one time off Otago Heads.

A dismantled double canoe named "Nga-toto," belonging to one Tahuahi, is said to have been seen on the Wai-rarapa coast-line in the "forties" of last century.

Of the origin of the double canoe Colonel Lane Fox writes: "The double canoe represents a variety in which both logs of the double-logged raft have developed into canoes. The two canoes are placed side by side at a little distance apart, and transverse spars lashed across the gunwales of both, a platform being built upon the cross-spars."

The distribution of the double canoe in the Pacific seems to be about the same as that of the outrigger. In Polynesia it was used in the Society, Cook, Paumotu, Hawaiian, Friendly, Marquesas, and Navigator Groups, also at many other isles, and at New Zealand. In Melanesia it was found in the Fijian Isles (see fig. 3), at New Caledonia and elsewhere; also it was used in Micronesia, and from northern Australia as far as India and Burmah.

Late Use of Double Canoe in the Bay of Plenty.—On the east coast the term *taurua* was applied to a temporary form of double canoe, as when two canoes were lashed together for some specific use, such as the manipulation of large seines. These seine-boats would at other times be used as two single canoes. Mr. W. Best, of Otaki, has informed us that he saw such a double canoe in use at Maketu, Bay of Plenty, about the year 1873. The natives had made a very large seine in the old way—that is, each family group living in the neighbourhood had made a certain length of net, after which all these separate

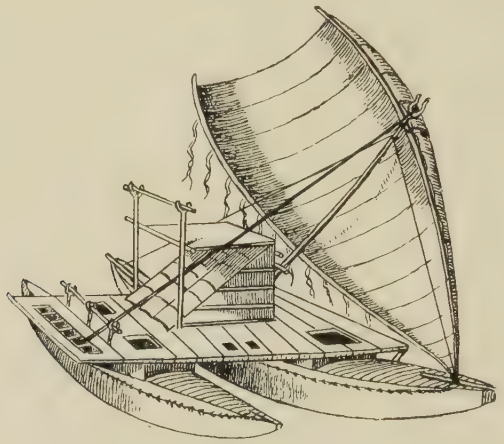


Fig. 3.—Double Canoe of Fiji, with Lateen Sail.

From *Fiji and the Fijians*, by T. Williams. Sketched by Miss E. Richardson from original.

pieces were joined together to form one huge seine 63 chains long and 30 ft. deep in the middle. Large as the seine was, still longer ones were seen by early voyagers to these shores.

When the seine was ready for use, two *waka taua*, which would not be less than 50 ft. to 60 ft. in length, were fastened together to serve as a seine-boat. These canoes were fitted with top-strakes, thwarts, and carved prow and stern-pieces. Poles were laid across the gunwales of both, securely lashed, and a platform about 20 ft. square constructed thereon. The seine was stacked or folded on this capacious platform, which was none too large for the purpose. The double canoe was then paddled out seaward, the seine being payed out as she progressed. The usual attachments of sinkers and floats kept the seine in the proper position. Our correspondent remarks that he saw this double canoe used for the above purpose on two different occasions.

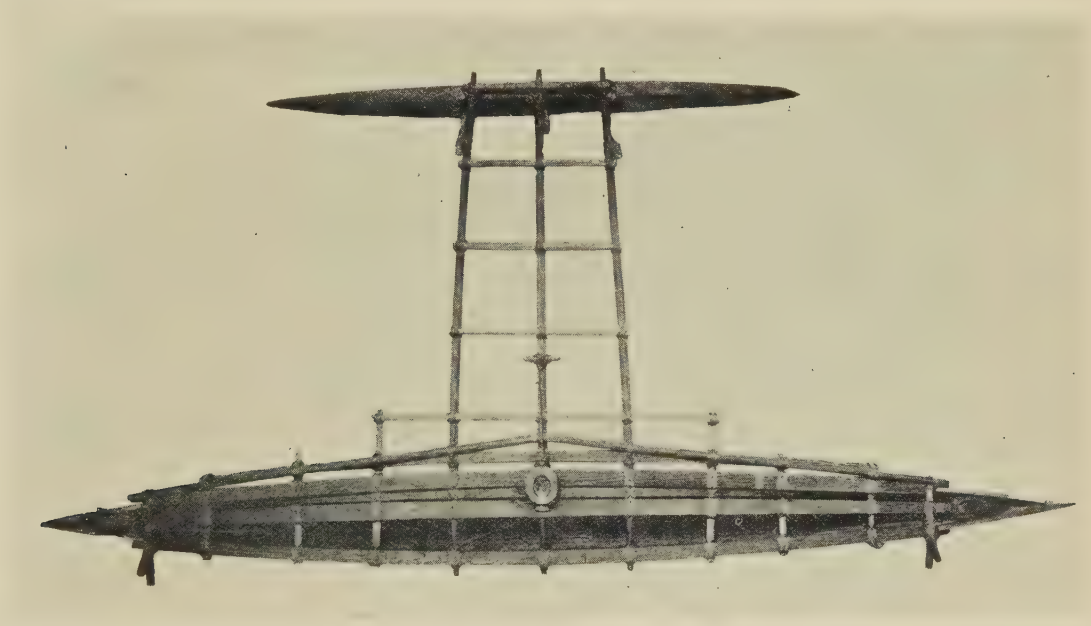
Such temporary joinings of two canoes for a special purpose differ from the permanent double canoe of Polynesia, but show that a knowledge of the usage has been preserved, and utilized to a late date.

The Moriori folk of the Chatham Isles had preserved a remembrance of the double canoe.

The Outrigger Canoe.

We have now to consider the single canoe provided with an outrigger on one side. There is no evidence to show that the double outrigger was ever used here, nor yet any balancing platform on the opposite side to the outrigger. The outrigger was undoubtedly introduced from Polynesia; indeed, all the single canoes that came hither from the isles of the Pacific must have been provided with this safeguard, to enable them to cross the rough seas encountered in the passage. The outrigger was a swifter sailing-craft than the double canoe, and could probably be paddled quicker. It is also said to be more easily managed during a storm or in a rough sea.

The outrigger was attached to the windward side of a canoe, and this would mean that the craft could not go about in tacking (*waihape*). Unfortunately, we have no information as to the form of the outrigger craft used by the Maori; presumably they were of the same shape at both ends. An outrigger is called the *ama*, *amatiatia*, and *korewa* by the Maori. The spars connecting it with the canoe are the *hokai*, but *kiato* is the common Polynesian term.



[*H. Hamilton, photo.*

Fig. 4.—Model of Small Single-outrigger Canoe of Gilbert Group.

(See also figs. 162, 164, and 164a, at pp. 248, 255, and 256.)

When Cook was passing Te Mahia, on the east coast, in his first voyage, some canoes with outriggers were seen, of which Parkinson writes, "Several of the canoes had outriggers; and one of them had a very curious piece of ornamental carving at the head of it."

In describing canoes seen at Queen Charlotte Sound in 1773 Forster says: "Some of the canoes were double—that is, two fastened alongside of each other by means of transverse sticks lashed on with ropes; but where that was not the case they had an outrigger, or narrow piece of plank, fixed parallel to one side of the canoe by means of transverse poles, to prevent their oversetting."

Te Whatahoro informs us that, as a lad, he made a short coastal trip in an outrigger canoe: "In the year 1853 a single outrigger canoe was brought from Waimarama down the coast to Te Unuunu, at Flat Point. There were sixteen of us on board, of whom seven were women. I was then about twelve years of age. Three of the elder men on board were Te Waka Tahu-ahi, Pahoro te Tio, and Te Meihana Takihi. I cannot say if that was the last time an outrigger canoe was used in our district or not."

This is the meagre information we get from our early voyagers; it is most disappointing — utterly lacking in detail. Cook and his companions, while at Queen Charlotte Sound, had a good opportunity to describe the Maori canoe in detail, but took no advantage of it.

The distribution of the outrigger is a matter of some interest. Its use extended from the eastern outposts of Polynesia right across the Pacific Ocean to India; also it was employed on one part of the east coast of Africa. In no other region was it, apparently, seen by early voyagers and travellers; it was essentially a Pacific and Indian Ocean usage, just touching the south-east shores of Asia, and was apparently an intrusive item on a part of the eastern coast of Africa. The range of the outrigger may yet bear evidence in the question of the origin and movements of the Polynesian race.

In a most interesting paper on "Early Modes of Navigation," Colonel Lane Fox derives both the double canoe and the outrigger canoe from the primitive log raft. Of the process of evolution he says: "In order to diminish the resistance, the obvious remedy was to use only two beams (logs), placed parallel to each other at a distance apart, with a platform, laid on cross-poles, between them." The Tasmanians used an improved raft of this kind, and are said to have made no form of canoe whatever. The Fijians used a similar contrivance, according to Williams, but also constructed canoes of a very advanced type. "From these two logs were derived the double canoe on the one hand, and the canoe with the outrigger on the other."

This writer also describes an intermediate form from Madras—a raft of three beams or logs lashed together, and provided with an outrigger composed of a log attached by means of outrigger poles to the raft. Both this and the Fijian catamaran appear to be survivals. He goes on to say, "When the art of hollowing out canoes was introduced, then one canoe and one log, or two canoes, were employed, as the case might be. This I consider to be a more natural sequence than to suppose the outrigger invented as a means of steadying the dugout canoe."

It seems not improbable that the outrigger originated in some region of south-eastern Asia or Indonesia. In connection with this subject the following extract from the *Journal of the Polynesian Society* (vol. 22, p. 24) is of interest. It was written by Mr. S. Percy Smith:—

"Ancient Indian vessels: Just here a word may be said as to the most ancient form of vessel known to the Indians themselves, for, if the Polynesians came from India, as we have suggested, the probability is that the same kind of craft were used by both peoples. A valuable work has lately been published by Radhakumud Mookeji, M.A., of the Calcutta University, entitled *Indian Shipping*, in which he treats of the trade and voyages made by the ancient Indians from the earliest dates, as derived from old records and from sculptures on old buildings, &c. From the illustrations given in this work it is clear that the earliest vessels of that people were made of planks sewn together with rope just as the canoes of the Polynesians were. The author says at page 47, 'These vessels were built so narrow and top-heavy that it was necessary to fit outriggers for safety. An outrigger is a series of planks or logs joined to the boat with long poles or spars, as shown in fig. 1.' This, of course, is exactly what the Polynesians do to this day, and have done for as far back as we can trace their forms of vessels. The illustrations of the ancient vessels are in fact just clumsy representations of the Polynesian canoe; and some of these pictures, carved in stone, are said to date as far back as the fourth century before Christ, or about the period that we suppose the Polynesians left India."

It must be borne in mind that the crank little outrigger craft seen at Ceylon, and at many of the isles of the Pacific, used in harbour and longshore work, are very different vessels from the big sea-going outrigger vessels of the Polynesians, such as were employed in their long voyages across the Pacific.

It is evident that the outrigger gradually fell into desuetude in New Zealand. Cook and his companions saw it at two places only, and the early missionaries and settlers in these isles do not mention it at all. Polack, who resided at the Bay of Islands for some years in the "thirties" of last century, and also visited the east coast as far as Tolaga Bay, writes as follows: "Outriggers, invariably made use of by the South-Sea-Islanders, are unknown in New Zealand, and canoes are never or rarely lashed together; nor are platforms raised over the gunwales, and sheds erected on them, as is the usage of the above nations."

The Double Outrigger.

Although there is no evidence to show that the double outrigger, one on each side of the vessel, was ever used in New Zealand waters, yet the Maori appears to know it traditionally. In the account of the migration by sea from the fatherland of the race, in times long passed away, is some curious information concerning the preparations made when a storm was approaching. In this narrative occurs the following: "*Katahi ka kokiri i nga korewa o te waka ki waho*" ("Then the outriggers of the canoe were thrust out"). Here the plural form is distinctly used, and also the outrigger is mentioned as having been attached at sea, on the approach of rough weather. This would mean that the vessels were not very narrow craft, but of sufficient beam to enable them to be used without an outrigger in calm weather. The account goes on to say that the *hokai* (booms or spars connecting the outrigger with the canoe) and the *huapae* were then lashed on, the latter being poles arranged on the booms parallel to the canoe, and lashed to the booms. Reference to the double outrigger is also noted in the traditionary account of the "Takitumu" canoe.

In his paper on the canoes of the Torres Strait area Professor Haddon gives some account of double outrigger canoes, as also several illustrations. This type is shown to have been used among the isles of Torres Strait and also on the Queensland coast—indeed, they appear to be still in use. The illustrations show two modes of attaching the booms to the canoe. In one method they are secured on the top of the sides of the vessel; in the other they are passed through holes in the upper parts of the sides. "Canoes with a double or single outrigger are confined to the Indo-Pacific area. . . In Africa they are confined to the east coast from Zanzibar to Mombasa . . . they occur also in South India, the Maldives, and Ceylon. They are found all over Indonesia and Oceania, and in North Queensland. . . The double outrigger with two booms occurs in East Africa." This writer also notes the double outrigger in Indonesia, but states that 'The double outrigger is at present almost entirely absent from Oceania except in the Nissan Islands." (The term "Oceania" presumably is applied to Micronesia, Polynesia, and Melanesia, or a part of the latter.) (See fig. 5, p. 18.)

To again quote Professor Haddon: "Dr. G. Brown states that the beautiful carvel-built sailing-canoes of the Samoan Islands had an outrigger on both sides. Frederici also says that the double outrigger no doubt occurred in the Marquesas at the time of the Mendana expedition. L. Choris figures a canoe from Easter Island with a double outrigger."

We thus see the double outrigger located in Polynesia, Torres Strait, Queensland, Indonesia, and the east coast of Africa. Further evidence is, however, desirable concerning its use within the Polynesian area.

The above writer remarks that in some places the double outrigger has been abandoned for the single, and that where the outrigger is not used in Indonesia such craft have been replaced by plank-built boats that need no such attachment.

It appears probable that the double outrigger originated in Indonesia or southern India.

An illustration of a north Queensland single-outrigger canoe taken from Roth shows sixteen booms arranged in pairs. The vessel is a very rude-looking craft as compared with the Maori sea-going canoe.

Most of the illustrations show the float to be attached to the booms by means of short sticks. The direct attachment of the float to the end of the boom is noted in the Nissan Isles and Easter Island.

The East Indian *sama* as a name for the float seems to be the Maori *ama* (an outrigger); Tonga, *hama* (an outrigger); Rotuma, *sama* (an outrigger).

[*H. Hamilton, photo.*

FIG. 5.—DOUBLE-OUTRIGGER CANOE OF INDONESIA.

From an old print.

On the Australian coast the outrigger was used in the north only, hence it seems probable that it was derived from the islands to the northward.

The word *korewa*, used as a name for the outrigger by the Taki.tumu folk of the east coast of the North Island of New Zealand, is evidently related to *korewa* (drifting about, adrift), to *karewa* (a buoy), and to *rewa* (to float). The better-known Maori term *ama* (outrigger) is widely distributed throughout the Pacific. It is applied to the outrigger at Samoa, Tahiti, the Marquesas and Paumotu Isles, at Mangareva and Futuna. At Tonga it becomes *hama*, at Rotuma *sama*, at Fiji *thama*. At Rarotonga the smaller

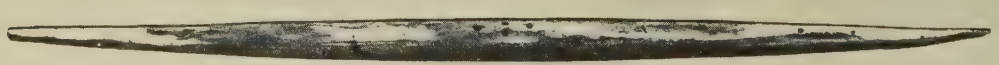


FIG. 6.—OLD OUTRIGGER FLOAT.

Found in Monk's Cave. Now in Christchurch Museum.

vessel of a double canoe was styled the *ama*, and the larger one the *katea*. In New Zealand we have also the form *amatiatia*, and this denotes the "pegged *ama*," an allusion to the method of attaching the float to the booms. The short intermediates were the *tia*, and this word was also employed as a verb, hence the expression "*Ka kawea te waka ki te moana tiatia ai*," as met with in the story of Rata.

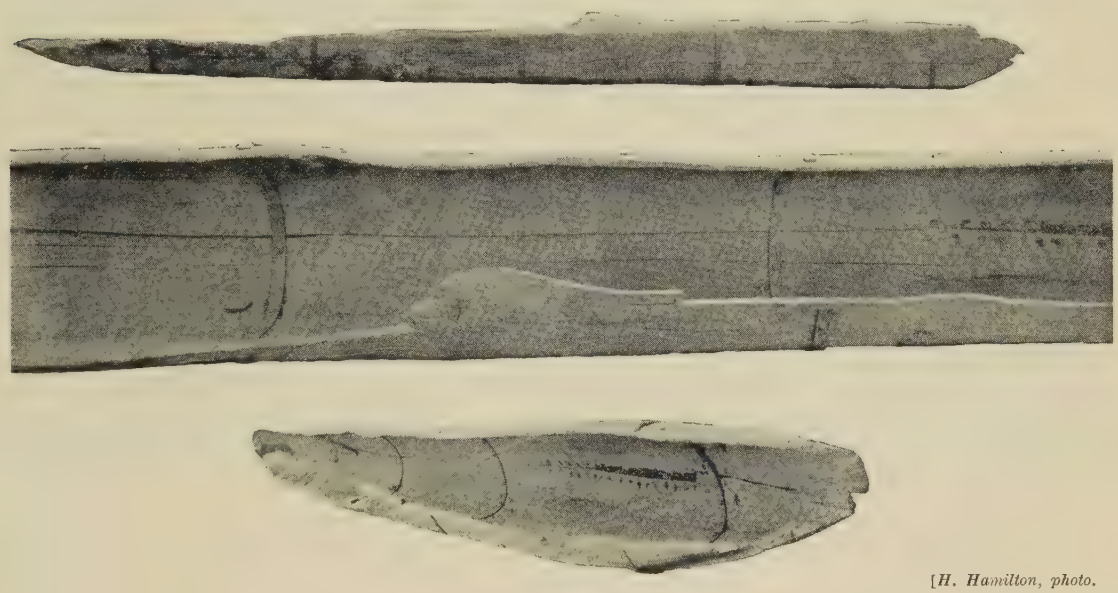
Colenso gives three applications of the term *ama*—"1, outrigger; 2, the platform on a double canoe; 3, the covered fore part of a canoe." But then he also has *ahikuku* and *ahipaipa* in his entertaining but somewhat abruptly ending lexicon!

Professor Tylor has told us that the outrigger was used in ancient Europe, but within historic times the west coast of India seems to have marked its western range limit in northern latitudes. It has been said that natives of Uganda employ the outrigger on Lake Victoria Nyanza: this may need corroboration.

A tradition collected by Mr. John White contains the following: "Hine-tu-a-hoanga was the chief of a great tribe at Hawaiki, and this tribe was numerous, and possessed many outrigger canoes by which they could sail on the ocean to the islands of the Hawaikian sea."

The following account of an old canoe found in the South Island is of much interest, for it describes what is probably the lone survivor of the old-time outrigger canoes of New Zealand:—

The Henley Canoe.—This is one of the most interesting objects in the Dominion Museum collection, on account of its peculiar form and its undoubted age, it being a relic of the stone-age culture of the Maori people. The canoe is 22 ft. 10 in. in length, and carries a width of 16 in. practically throughout—that is, to within a short distance of the ends, the same being an unusual



[*H. Hamilton, photo.*

FIG. 7.—THE HENLEY CANOE.

A very old canoe of outrigger type found in the South Island.

feature. It would be classed as a *tiwai*, or river-canoe, owing to its small size and lack of top-strakes. From the situation in which it was found it is evident that it was used for fishing in the shallow waters of Waipori and Waihola Lakes, and the swamps and streams about there. It is a very singular fact that the widest part of the hull is not at the top, not the distance between the two gunwales, but at a point much lower down. The angles from which the sides tumble in are quite sharply defined, and are about midway down the sides. One side is much broken away, but the other, though of irregular outline, is apparently as it was when the craft was in use; a portion of the gunwale certainly presents a dressed surface. The abnormal feature of the cross-section continues throughout the length of the vessel, and is one that is otherwise unknown in connection with Maori forms. [See fig. 8, p. 20.] Considering the position in which the canoe was found, we may assume that its age might well be represented by centuries, knowing as we do that such rude forms have been discovered beneath the surface in lands that have long supported an advanced civilization. The bottom of the vessel is neither rounded nor yet sharp, but presents a flattened surface about 3 in. wide. Depth of hold in middle of vessel, 16 in. On the side that appears intact, or nearly so, two holes, 3 in. apart, pierce the upper part near the middle. Towards one end of the same side

appear two single holes, far apart; towards the other end are three single holes, also far apart. These may have been connected with the securing of thwarts, or an outrigger. These holes have not been bored, but have been chipped or chiselled out roughly with a small stone tool, the work having been done from both sides. The holes are most ragged and unsightly—very different in appearance to those made with a stone pointed drill. The bite of the tools used is clearly seen in many of these holes, as also on the inner surfaces of the canoe. The log was a knotty one, and difficult to work in some parts on that account; some extra-hard knot cores have been left projecting, as being too hard to be reduced by the stone tools employed. The marks of the tools employed, however, show clearly that such stone implements were serviceable in hewing solid timber, and that their use was by no means confined to the chipping-off of fire-charred surfaces. Some of the cuts are broad and bold as if the adze had been used with a swing. In some places the adzing has been done across the grain, in the usual way, but the bottom part of the interior has been dressed with the grain, the narrowness of the hold being responsible for this change.

FIG. 8.—CROSS-SECTIONS OF THE HENLEY CANOE AND OF THE COMMON MAORI FORM OF CANOE.

A, Henley canoe; B, Maori canoe.

It seems probable that the sides of this vessel became warped, or contracted, after its extraction from the swamp. Possibly also in attaching the iron brace-bands that hold it together the sides were drawn in too much, for the narrowness of the hull across the top is remarkable. Thus, in the half of the canoe having its two sides fairly well intact, the width from the top of one side to that of the other is but 10 in. at one place and 13 in. the rest of the way. Unless it was wider than this originally it is difficult to imagine how the inner sides of the hull can have been hewn across the grain, as they assuredly have been. The inward-trending upper part of the sides shows a flat exterior surface, 10 in. to 12 in. wide, from the sharply defined longitudinal ridge, below which the sides curve downward to the flat keel; at both ends this flat keel, of about 3 in. in width, merges in a sharp cutwater.

Apart from later fractures and splitting, there are three old cracks of somewhat formidable dimensions, and which have been patched-sewn, as it were, by the old-time owners of the vessel. All that remains of such work is seen in the rows of roughly chiselled holes, one row on either side of each split. These holes are pierced right through the hull to the outside, as is done in securing

a top-strake, and the lashings that passed through them probably gripped and confined two battens placed so as to cover the split, or possibly only one in the inside. There is no evidence to show that the lashings were countersunk on the outer side of the hull, as was done by the more modern Maori.

The canoe, carrying, as it does, practically the same width throughout, except at its extremities, and being narrow withal, conveys the impression that it must necessarily have been crank and liable to capsize, unless indeed it was provided with an outrigger, or formed part of a double canoe, or was very much ballasted. (Very light canoes were suitable for the lower Taieri district, where flat-bottomed punts are used now.)

The singular form of this canoe endows it with much interest, for it is certainly unique, a type that is unknown to us. As to its age, that might be represented by one century or ten, when we consider the conditions under which it has been preserved. It reminds one of certain extremely narrow outrigger canoes of Melanesia, in which the hold is so narrow that an occupant has to place one foot in front of the other. (See fig. 9.)

Some of the caulking-material extracted from the holes in the hull apparently consists of grass and *raupo*.

[*Beattie, photo.*

FIG. 9.—SMALL OUTRIGGER CANOE OF REEF ISLANDS, MELANESIA.

The Henley canoe, with its narrow hull-opening, must have closely resembled this western form.

The exhibit is marked as an "Ancient canoe from Otago. Fragments of an old canoe of peculiar shape, dug out of swampy ground at Henley, on the Taieri, in Otago. . . Another canoe was found near by, but this soon perished, being constructed of different wood. . . The timber looks like *totara*.

[The canoe was rescued by Mr. John Stephenson, one of the oldest residents in the Taieri Plain, when digging a ditch in the Henley Estate, of which he was manager, probably about 1895. Several small objects of wood were found with it, but these perished. The Henley Estate is reclaimed swamp on which extensive drainage-works have been executed, out of which numerous ancient implements and other objects have been dug. The canoe was found beneath the surface entirely buried under ages of accumulated silt. A glance at the plain from the neighbouring hills shows that it is largely self-reclaimed; that this process has been going on for ages; that the two lakes are mere pools remaining after the silting-up of a large area. The special interest of this canoe lies in this fact: it must have taken an immense time to bury it up by the slow process of silting up. It is an excellent example of undoubted neolithic work, showing (*a*) the vigorous cuts made by a stone adze properly wielded, (*b*) the extreme difficulty of dealing with a knot, (*c*) the absolute inefficiency of the tools of the period in dealing with holes as compared with the clean work of the greenstone drill. These indications seem to me to point to the conclusion that the canoe belonged to the Waitaha, or some other very early occupants of the district. The smallness of the sinkers

found in undoubted Waitaha refuse-heaps convinced me long ago that they were not a seafaring people, and I should expect to find them using small river-canoes. When I first knew that district there were still to be seen in the Taieri River small fishing-canoes, one of which I think is in the Otago Museum; the type is very different from this.]

The matter given in brackets was contributed by Sir Frederick Chapman, the former owner of this canoe. The Waitaha folk alluded to were early occupants of the South Island. Although, as observed above, several knots have been left protruding, yet others have been reduced by adzing, one yet showing clean cuts. The bottom part of the interior has evidently been adzed with the grain, but the sides of the interior have certainly been dressed downwards—*i.e.*, across the grain at the narrower parts. Possibly the tree was a hollow one, which might account for the peculiar form of the interior of the canoe.

Illustrations of a canoe of Vanikoro (Queen Charlotte Islands, north of New Hebrides) show a cross-section of hull much resembling that of the above-described craft. The hold resembles a long, narrow slit, so pronounced is the inward trend of the sides of the hull. The bottom is much rounded, and the vessel would be useless without an outrigger. This is shown in D'Urville's plates, who terms the craft a "small pirogue." The cross-section of a canoe of the New Hebrides shown in Edge Partington's *Ethnographic Album of the Pacific* also shows a marked resemblance to the Henley canoe. It is singular that this Melanesian form is the nearest known approach to the disinterred South Island canoe that we have described. It seems highly improbable that the latter vessel would be of any service without an outrigger, so crank is it, and the holes pierced through the upper part of the sides may have been for the purpose of securing the booms. A top-strake would be superfluous with the inward-trending sides of the canoe.

An illustration of small outrigger canoes of the New Hebrides in *The Savage South Seas* (p. 66) shows two rude narrow dugouts much resembling the Henley canoe described above. In these craft the hold is too narrow to admit a man's body, hence the paddlers are sitting upon short planks laid across the dugout. The rough boom poles are lashed to both gunwales. The upper parts of the sides show the same inward trend seen in the Henley canoe. In both these forms more of the log was utilized than in the making of the Maori dugout hull. In the Henley type the upper part of the log, above the centre, was hollowed out and formed part of the dugout, but little being lost in the preliminary flattening process; whereas in the Maori type nearly half the log must have been chipped off and discarded in that process.

The Single Canoe having no Outrigger.

We now come to the ordinary type of Maori canoe, the only one that has survived to our time, and concerning which we can give a detailed description. In the first place, it should be mentioned that this type may be subdivided into three classes, as follows:—

A. The *waka taua*, or war-canoe. The finest specimens of native canoes were of this class. Of large size and elaborately ornamented; provided with top-strakes and highly carved prow and stern-piece.

B. The *waka tete*. A smaller canoe, used for travelling and fishing purposes. Fitted with top-strakes and inferior prow and stern-pieces, but no elaborate ornamentation.

C. The *waka tiwai*. Smaller than, and inferior to, the B class. A plain dugout hull with no top-strakes, prow, or stern-piece, or any form of ornament. Hull generally in one piece, whereas in A and B classes it might be composed of two or even three pieces. Used in harbours and rivers, occasionally in sea-fishing near the coast, but not in deep-sea fishing.

Of type C also were diminutive canoes that might contain one, two, or three persons, and were used in calm waters, harbours, lakes, and rivers. These are known as *korea*, *kopapa*, and *koki*. They were much used in former times for the conveyance of supplies in tranquil waters, and for other ordinary purposes.

In the Waiapu district the term *kopapa* is applied not only to a small canoe, but also to a short plank or board used in surf-riding. *Williams's Maori Dictionary* gives—"*Konia*, a canoe. *Pinaku*, a war-canoe; same as *pitau* (*waka taua* class). *Waka tokau*, or *totokau*, a canoe with top-strakes, but no prow or stern-piece. *Waka koporo*, a square-sterned canoe." Canoes were not, apparently, made in this form, but an end, if broken, might be cut off and so the craft became a *koporo*.

Mr. S. P. Smith speaks of *reti* or *retireti* as an obsolete term for a canoe.

Pora: Concerning this word Williams gives "*Pora* = a ship. *Tangata pora* = a man from shipboard, a foreigner." The Moriori folk of the Chatham Isles also called a ship *pora*. The writer cannot say as to what type of canoe was termed a *pora* by the Maori in former times. From *Tregear's Dictionary* we get—"Samoan: *Polapola*—a flat-built canoe (?); *pola vaka*—mat used to cover a canoe. Hawaiian: *Pola*—the high seat between the canoes of a double canoe. Tahitian: *Farepora*—small house on a double canoe."

It is not clear as to what is meant by a "flat-built canoe"—possibly a shallow craft of wide beam. Of the *pola vaka* Colenso remarks: "Which, I suppose, is extended horizontally over them [canoes], as was formerly the case in New Zealand." Apparently he had heard some tradition of canoe-awnings having been used here. Such awnings do not seem to have been quoted by any other early writer except Sir Joseph Banks (1769), who speaks of having seen near the East Cape "many very large canoes upon the beach, some hundreds I may safely say, some of which either had or appeared to have awnings." Possibly these awnings were canoe-sheds. As to the *whare pora*, this term was applied by the Maori to a flat-roofed house—that is, presumably, to a low-pitched roof. *Pora*, as applied to a European ship, was employed principally in the South Island and the southern part of the North Island. There is nothing to show which form of canoe it was applied to, or why our vessels were so termed. Colenso thought that the latter were so called "on account of the flatness of the ceilings below decks"—which does not seem very convincing.

The following notes on native canoes were contributed by Mohi Turei, of the Ngati-Porou Tribe of the east coast, to the *Pipiwharauroa*, a Maori paper published at Gisborne. Mohi was a man who possessed a considerable amount of knowledge concerning the customs, industries, and traditions of his ancestors:—

Mo te tete waka, ara mo te tauihu tete. E wha nga waka nei: (1) He waka toiera; (2) he waka pitau; (3) he waka pakoko; (4) he waka tete.

1. Te toiera [? = toiere] he waka nui, me ona ingoa waka nui ano,—he waka taua, he waka puhi potae, he waka taroro, he tuki, he parata. Ko te parata kei runga tonu i te matatara o te tinana ake o te waka, e hara i te mea hoatu; ka whakairoa, ka pukana nga kanohi, ka hamama te waha, ka tarewa te arero, ka tete nga niho, pani rawa ki te karamea. I kiia ai te parata he ika kai te moana, he parata te ingoa, he taniwha. . . Kei runga tonu i te tauihu nei te tara [? tetahi] whakairo e kiia ana he toiera. Ko ona huruhuru kereru, me etahi atu manu, ka mahia ki runga ki nga rakau pai e rua, ka herea nga pito o aua rakau ki tetahi taha o te tauihu, ki tetahi taha; puhi rawa nga pito o waho ki te puhi kereru, ka kiia he taroro. Ko te puhi potae kei te taurapa, he mahinga nui to tera, ka kiia he puhi potae; hei reira ano tetahi whakairo kei te taurapa, he toiera.

2. Ko te pitau he waka nui; ko tona ingoa whakanui, he waka taua, he pitau whakareia, ringa-whiu. He whakairo te pitau, kei te tauihu, kei te taurapa, me te whakarei. Ko te ringa-whiu, ko nga ringaringa o te tauihu i whiua ki muri. Kei reira ano te upoko, nga kanohi, me te waha e hamama ana, te arero e whatero ana, nga niho e tete ana, me te puku, me nga waewae, pani rawa ki te karamea, ruku tonu atu ki roto o te ngaru.

3. Ko te tuatoru o nga waka nei, he waka pakoko te ingoa, he waka nui. Ko te upoko o te tauihu i anga ke mai ki te riu o te waka te kanohi, whakairo rawa nga moko katoa, ano he tangata ora, pani rawa ki te hinu hei whakawahi. Ka tuhia ano nga moko kua haehaetia ra ki te kauri pango, poha rawa ki te kapia toera. Ko nga kanohi i moe, me te waha i kumu, kihai i hamama. No konei te ingoa nei a te pakoko, no te moenga o nga kanohi, no te kumunga o te waha. Ko te puhi kereru i runga i te upoko, ko te kopako i parea atu hei patukitanga mai ma te ngaru. Ka mate te rangatira, ka tapahia te upoko, ka whakapakokotia; maha atu nga tau e tangihia ai. Ahakoa nui te waka,

roa, ka mau taua tauihu ki runga, ka kiia he waka pakoko, na te moenga o nga kanohi, na te kumunga o te waha. Pera hoki te ahua o te tupapaku e whakapakokotia ana, he mea whakamoe nga kanohi, he mea kuku te waha.

4. Te waka tete, kei te rae tetahi whakairo he tete te ingoa ; kei raro i te kauae he tete ; ka mau ki runga ki te waka, ka kiia he tete.

Ko enei waka, ko te tete, ko te waka pakoko, he waka whai kai, tona ingoa he waka tuku koura, hi ika.

Ko te toiere, me te pitau, takoto tonu ai i uta i rote i nga tawharau, ma nga haere nunui anake ka manu ai ki te moana. Ka haere ano nga waka pakoko, tete, ki nga haere nunui, ope taua, tapakuwha, kaihaukai, tangihanga tupapaku. Tona ingoa nui mo aua waka i enei haere, mo te waka pakoko, mo te waka tete—he waka mau o. Me whakamarama ake te waka tete nei i te haerenga ki te tangihanga tupapaku, i kiia rawatia ai te waka tete nei he waka mau o.

This article is of much interest, but unfortunately was so badly printed that some parts are doubtful. It also contains a few expressions that are unknown to us. Here follows a rude translation of the matter :—

Regarding the *tete* of a canoe—that is, the *tete* figurehead : Now, there are four types of canoes—(1) *Waka toiera ;* (2) *waka pitau ;* (3) *waka pakoko ;* (4) *waka tete.*

1. The *toiera* is a large canoe, having its appropriate names, as " war-canoe," " feather-decked canoe," " *taroro* canoe," " *tuki,*" and " *parata.*" The *parata* is [situated] on the *matatara* of the body of the canoe, it is not an attached item ; [it was] carved with distorted eyes, open mouth, protruding tongue, exposed teeth, and painted with red ochre. It was said that the *parata* is a sea-fish, an ocean monster. . . On the *tauihu* is a certain carved design called a *toiera.* Feathers of pigeons and other birds were arranged on two suitable rods. The ends of those rods were tied on either side of the *tauihu* [figurehead], their outer ends were adorned with pigeon-feathers, and it was then known as a *taroro.* The *puhi potae* pertained to the *taurapa* [stern-piece] and involved much work, being known as a *puhi potae.* At that place also, on the *taurapa,* is a certain carved design, a *toiera.*

2. The *pitau* is a large canoe, dignified by the names " war-canoe," " *pitau whakareia* " and " *ringa-whiu.*" The *pitau* was carved as to the *tauihu,* the *taurapa,* and the *whakarei.* In the *ringa-whiu* the arms of the figurehead extended backwards. There also is the head, the eyes, the open mouth, the protruding tongue, the exposed teeth, the stomach, the legs, all painted with red ochre, and in the act of cleaving the waves.

3. The third canoe, styled a " *waka pakoko,*" was a large vessel. The head of the *tauihu* [figurehead] was turned so as to face the hold of the canoe, and had all tattooing-devices carved on it so that it resembled a living person ; then it was anointed with oil. The incised tattoo-lines were marked with black pigment. . . The eyes were closed, and the mouth was closed, not open. From this fact —from the closed eyes and the closed mouth—is derived the name *pakoko.* The ornaments of pigeon-feathers were on the head ; the back of the head was turned [reversed] to serve as a striking-place for the waves. (When a chief died, his head was cut off and dried ; this would be wailed over for many years.) Though the canoe be a large one, and long, if that form of figurehead was affixed to it, then it was called a *waka pakoko,* on account of the closed eyes and closed mouth. Of that aspect also was a dead person when preserved by drying—the eyes and mouth were closed.

4. As to the *waka tete,* on the *rae* [? forehead of figurehead] is a certain design called a *tete,* and on the chin is a *tete ;* when such are on a canoe it is styled a *tete.*

These canoes, the *tete* and the *pakoko,* were employed in obtaining food, in fishing, and the setting of lobster-pots.

The *toiere* and the *pitau* were kept in sheds ashore ; for important occasions only were they launched. The *pakoko* and *tete* canoes also accompanied important expeditions connected with war, marriage, ceremonial feasts, and mourning for the dead. The general name for those canoes on such journeys—that is, for the *pakoko* and *tete* canoes—was " provision-canoes." It must be explained that the *waka tete,* when used in proceeding to mourning functions, was certainly alluded to as a provision-carrying vessel.

In the above notes Mohi uses the term *toiera* where Waikato and other tribes employ *toiere ;* while *taroro* seems to be connected with the *ihiihi* or projecting rods at the prow. In one case he uses *toiere ;* thus *toiera* is probably a variant form. *Matatara,* an unknown word to the writer in this connection, seems to be applied to the forward extremity of the hull of a canoe ; it is clearly stated that the *parata* design was carved on this part, and was not detachable. It was on this part that the carved head-piece or prow, the

tauihu, was secured. What monster of the ocean the name *parata* is applied to we cannot say, but in Maori myth the tides are caused by a sea-monster of that name. The name *pitau* is probably derived from the scrolls of the carved attachments. The inward-facing figure of the figurehead of the *waka pakoko* is also known as a *whakaanga*. Apparently the carved head showing closed eyes and mouth was named *pakoko* because it resembled a preserved (dried) human head which had the eyelids and lips sewn together. The *tete* design may be seen carved on a figurehead in the Dominion Museum. The *waka tete* had a figurehead lacking limbs.

Of the Maori canoes Wilkes wrote in 1840, "They are without an outrigger, and differ in this respect from the boats of all other Polynesians south of the Equator. They have also adopted the square sail (which generally consists of a blanket) in place of the triangular one common to all Polynesia." The square sail was, of course, never used in pre-European times.

The Waka Taua, or War-canoe.

This is the highest type of Maori canoe—always of large size, and adorned with carved designs, paint, and feathers in an elaborate manner. It is usually known as a *waka taua*,

Fig. 10.—Maori War-canoe as depicted in Cook's Voyages.

or war-canoe, though used for other purposes, such as ordinary water excursions. It is also known as a *waka pitau*. *Williams's Maori Dictionary* gives *pitau* as (1) perforated carving; (2) figurehead of a canoe ornamented with perforated carving; (3) war-canoe with a figurehead representing the whole human figure—*i.e.*, one not representing a head only. *Pitau* also seems to be applied to a scroll in carving. *Pinaku* is another name for a war-canoe.

Another term, *waka whakarei*, is applied to a war-canoe, but this name simply serves to mean a canoe adorned with carved designs. Thus we have the terms *waka whakarei papatahi* (a superior, ornamented single canoe); *waka whakarei unua* (a superior, ornamented double canoe). The word *whakarei* seems to refer to carved adornments, or possibly to canoe-adornments generally. It is met with in the expression "*Me he pitau whakareia.*"

Williams gives *pitau whakareia* as denoting "figurehead of a canoe with arms turned backwards," a peculiarity only seen in the more ornate kinds; and *whakarei* as "carved work at the head and stern of a canoe," also "canoe with elaborately carved figurehead, bust and arms."

Library
Arizona State Museum

Another old saying is "*Me te waka whakarei e tau ana i te moana.*" This is a simile—"Like a fine canoe floating on the ocean," a remark to show one's appreciation of the appearance of a fine house.

Prior to describing the making of a first-class canoe we will note what has been said of them by various writers, from the time of Cook onwards.

1769. Of the Maori *waka*, or canoe, Sir Joseph Banks says in his journal: "They are built of very thin planks sewn together, their sides rounding up like ours, but very narrow for their length. Some are immensely long. One I saw which the people laid alongside the ship as if to show how much longer she was than the canoe fairly reached from the anchor that hung at the bows to quite aft; but, indeed, we saw few so large as that. All, except a few we saw at Mercury Bay, which were merely trunks of trees hollowed out by fire, were more or less ornamented by carving. The common fishing-canoe had no ornament but the face of a man with a monstrous tongue, whose eyes were generally inlaid with a kind of shell like mother-of-pearl; but the larger sort, which seemed to be intended for war, were really magnificently adorned. The head was formed by a plank projecting about three feet before the

[*H. Hamilton, photo.*

FIG. 11.—ILLUSTRATION OF WAR-CANOE AS IT APPEARS IN VOLUME OF ILLUSTRATIONS TO COOK'S VOYAGES.

(Illustrates carelessness of copyist.)

canoe, and on the stern stood another, proportioned to the size of the canoe, from ten to eighteen feet high. Both these were richly carved with openwork, and covered with loose fringes of black feathers that had a most graceful effect. The gunnel-boards were also often carved in grotesque taste, and ornamented with white feathers in bunches placed upon a black ground at certain intervals. They sometimes joined two small canoes together, and now and then made use of an outrigger, as is practised in the islands, but this was more common to the southward." (See fig. 11.)

The first remark quoted, as to Maori canoes being built of "very thin planks sewn together," must be looked at askance. Large canoes had a top-strake (plank lashed on the sides to increase their height), but the evidence tends to show that in most cases only one such top board was attached to the sides of the dugout hull. Occasionally two, secured one above the other in carvel fashion, were employed. Other writers have made similar remarks, but it is improbable that they ever saw more than two *rauawa*, or top-strakes, on a Maori canoe. Nor were such planks thin ones, but good stout timbers.

Of the canoes seen at Poverty Bay this writer says: "Their boats were not large, but well made, something like our whaleboats, not longer. The bottom was the trunk of a tree hollowed out, and very thin. This was raised by a board on each side, with a strip of wood sewed over the seam to make it tight. On the prow of every one was carved the head of a man with an enormous tongue reaching out of his mouth." Here the same writer describes the single top-strake on fishing-canoes (*waka tete*).

1769. In speaking of the canoe captured by Cook at Poverty Bay, Parkinson says: "The canoe was thirty feet long, made of planks sewed together, and had a lug-sail made of matting." The natives on this canoe, when chased, threw stones at their pursuers, and fought them with their paddles. This was certainly a common type of craft and no war-canoe. The "planks sewed together" is probably an error: a canoe of that size would not be fitted with more than one top-strake. The sail was certainly not a lug-sail in the sense of being a square sail.

In L'Horne's journal of M. de Surville's voyage, given in McNab's *Historical Records of New Zealand* (vol. 2), is the following account of Maori canoes. Its date of 1769 imparts value to it, though it is woefully brief: "Their boats are, indeed, of one piece of wood, pointed at both ends, but the sides are made higher by some boards strongly fixed to the boat with ropes made of rushes. These boards are called *fargues* in the navy, and they do not reach as far as the end of the boat. The point of the boat is covered with a piece of wood, carved so as to fit exactly. They made a groove in this piece of wood, in order to fit it across a board. The *fargues* are joined to this cross-plank at each end, and keep it in its place. On the two ends of the boat are also fixed two pieces of wood ornamented with feathers and tufts of dog's hair. I saw some boats which did not have these ornaments on the fore part. I believe that these ornaments are a sign of distinction, as I noticed that the chiefs have the ornaments at both ends, and the secondary chiefs only at the front part of the boat." Here we have the expression "some boards fixed to the boat," which might mean one on each side.

In Monneron's journal of de Surville's voyage, published in vol. 2 of McNab's *Historical Records of New Zealand*, are the following brief remarks on Maori canoes: "Their boats, as a rule, are very long. The bottom part is of one piece. To raise the boarding they sometimes make use of one or two planks. In the front and hind parts of the canoes are found some pieces of carving." This was in 1769. This is somewhat more definite, and possibly some canoes furnished with double top boards were seen.

During Cook's third voyage Mr. Anderson made some notes on the canoes of Queen Charolotte Sound natives: "Their boats are well built, of planks raised upon each other and fastened with strong withes, which also bind a long narrow piece on the outside of the seams to prevent their leaking. Some are fifty feet long, and so broad as to be able to sail without an outrigger; but the smaller sort commonly have one, and they often fasten two together by rafters, which we then call a double canoe. They carry from five to thirty men or more. . . Their paddles are about four or five feet long, narrow and pointed, with which, when they keep time, the boat is pushed along pretty swiftly. Their sail, which is seldom used, is made of a mat of a triangular shape, having the broadest part above." Here again we have careless observation or careless writing. No native vessels were built of planks, but these were employed in order to raise the sides of dugout hulls.

1769. Of canoes seen on the east coast Parkinson writes: "Their canoes had from eighteen to twenty-two men in them, and were adorned with fine heads made out of a thick board, cut through like filligree work, in spirals of very curious workmanship. At the end of this was a head with two large eyes of mother-of-pearl, and a large heart-shaped tongue. This figure went round the bottom of the board, and had

feet and hands carved upon it very neatly, and painted red: they had also high-peaked sterns, wrought in filligree, and adorned with feathers, from the top of which depended two long streamers, made of feathers, which almost reached the water. Some of these canoes were between fifty and sixty feet long, and rowed with eighteen paddles."

Parkinson was struck by the manner in which these canoe-crews beat time with their paddles when chanting their *haka* or *ngeri* songs, all striking their paddles on the thwarts at the same instant—"all of which afforded a truly comic act."

1769. Of the vessels seen in the Hauraki Gulf Cook remarks: "Their canoes were large and well built, and adorned with carving, in as good a taste as any that we had seen upon the coast." This writer also describes a canoe seen on the east coast: "The people shew great ingenuity and good workmanship in the building and framing their boats or canoes. They are long and narrow, and shaped very much like a New England whaleboat. Their large canoes are, I believe, built wholly for war, and will carry from forty to eighty or one hundred men, with their arms, &c. I shall give the dimensions of one which I measured that lay ashore at Tolaga: Length, 68½ ft.; breadth, 5 ft.; and depth, 3½ ft.; the bottom sharp, inclining to a wedge, and was made of three pieces hollowed out to about two inches or an inch and a half thick, and well fastened together with strong plaiting. Each side consisted of one plank only, which was 63 feet long, and 10 or 12 inches broad, and about 1¼ inches thick, and these were well fitted and lashed to the bottom part. There were a number of thwarts laid across and lashed to each gunwale as a strengthening to the boat. The head ornament projected five or six feet without the body of the boat, and was four feet high; the stern ornament was fourteen feet high, about two feet broad, and about one and a half inches thick; it was fixed upon the stern of the canoe like the stern-post of a ship upon her keel. The ornaments of both head and stern and the two side-boards were of carved work, and, in my opinion, neither ill designed nor executed. All their canoes are built after this plan, and few are less than twenty feet long. Some of the small ones we have seen with outriggers, but this is not common. In their war-canoes they generally have a quantity of bird's feathers hung in strings, and tied about the head and stern as additional ornaments. . . Their paddles are small, light, and neatly made; they hardly ever make use of sails, at least that we saw, and those they have are but ill contrived, being generally a piece of netting spread between two poles, which serve for both masts and yards."

Here we have a canoe-hull of three pieces joined together, a process to be hereinafter described, with a single top-strake. The thickness of 1½ in. or 2 in. given for the hull was probably that of the sides; the lower parts would probably be thicker. It may be noted that outriggers were not common, and apparently only used with the small canoes.

In speaking of his intercourse with the natives of New Zealand Cook says: "Whenever we were visited by any number of them that had never heard or seen anything of us before, they generally came off in the largest canoe they had, some of which will carry sixty, eighty, or one hundred people. They always brought their best clothes along with them, which they put on as soon as they came near the ship. In each canoe was generally an old man, in some two or three; these always used to direct the others, were better clothed, and generally carried a halberd or battle-axe in their hands."

1772. The following notes are those of Crozet, made in 1772 at the Bay of Islands: "All the villages situated in the middle of the Bay of Islands, where we anchored, possessed a considerable number of canoes. These boats, which were dugouts, appeared to be generally well made, with lines calculated for speed, well worked, and more or less carved. The majority of the canoes were from twenty to twenty-five feet long, by two and a half to three feet broad. Their principal use is for fishing, and

every canoe ordinarily carried from seven or eight men. Besides these boats, which appeared to be private property, every village possesses in common two or three big war-canoes for attacking purposes. I measured one of them which was seventy feet long by six feet broad and four deep, made of the body of a single three-trunk, the two sides of which were raised by means of planks skilfully sewn on, the sewing well caulked, and the whole canoe painted red by the aid of oil. These war-canoes have carved and very high poops and prows."

1773. Forster, in 1773, noted at Queen Charlotte Sound the curious prow attachment known as the *ihiihi*: "The war-canoe in which the expedition had been made had a carved head ornamented with bunches of brown feathers, and a double forked prong projected from it, on which the heart of their slain was transfixed."

Forster also remarks as follows on Maori canoes: "Their boats are stronger than those of Tierra del Fuego, and not without taste in their ornaments, nor without contrivance in their whole structure and shape, which, with the dextrous management of their paddles, gives them an easy and swift motion."

1816. Ellis, who visited the far north of New Zealand in 1816, remarks concerning some canoes seen: "Their canoes were all single, generally between twenty and thirty feet long, formed out of one tree, and nearly destitute of every kind of ornament." Evidently these were fishing-canoes. Shortly afterwards he saw some *waka taua*, of which he writes: "Their long, stately, and in many instances beautifully carved canoes were drawn up on the pebbly beach, and the chiefs and warriors were sitting in circles, at a small distance from them. Each party occupied the beach opposite their canoes, while the slaves or domestics, at some distance further from the shore, were busied round their respective fires, preparing their masters' food. Near his side each warrior's spear was fixed in the ground, while his *patu*, a stone weapon, was hanging on his arm."

1824. In Tyerman and Bennet's *Voyage*, 1824, occurs the following: "Their canoes were from thirty to forty feet in length, and three to four in width, each hollowed out of the trunk of a single tree, narrow at either end, and broadest in the middle, having cross-bars to strengthen the sides. Some of these were painted red and rudely carved with figures. . . Their paddles were long, lancet-shaped, and very narrow. With these they navigate their simple vessels sufficiently well; the latter, being wide above, and reduced to an angle along the keel, are calculated for steady sailing." Apparently some of these early voyagers calling or sojourning at places in New Zealand did not chance to see specimens of the big canoes mentioned by others.

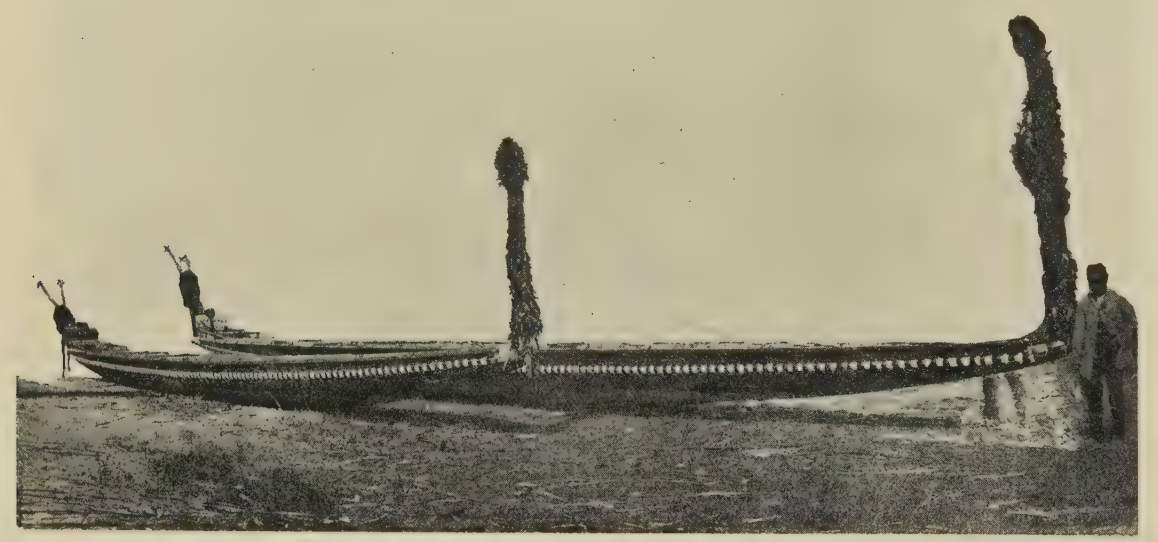
Earle, a sojourner in the far north in 1827, writes: "A dozen superb war-canoes were lying ready to convey the forces; and, considering their limited means, the solidarity of their structure and the carved work on them are surprising. None but men of rank are allowed to work upon them, and they labour like slaves. Some canoes were to be lengthened; others patched; others were condemned to be broken up, and the fragments taken to complete new ones. . . Here were carvers, painters, caulkers, and sailmakers, all working in their different departments. . . Some of their vessels were eighty feet long, and were entirely covered with beautiful carvings. . . When it is considered that in each canoe were seated eighty stout young men, each with a large paddle in his hand propelling the vessel forward, the velocity with which she flew may be imagined."

1838. Missionary Wade makes the following remarks concerning canoes seen by him at Roto-rua in 1838: "I was much struck with their war-canoes, which were arranged with regularity in a sort of dockyard outside the *pa*, some of them unfinished, but completing for the expected renewal of war. One of the canoes measured sixty feet long; another, of a broader and a more boat-like build than usual, was six feet six inches in the beam. One day, in crossing the lake, we were accompanied by three or

four natives in a small fancy canoe, perfectly finished in imitation of a war-vessel, but as disproportionate in size to the persons who were in it as Raphael's boat in the cartoon of the draught of fishes: it could only be used on very calm days, and was attended by another canoe, in case of accident." This latter item is one on which we have absolutely no further information. Presumably it was an isolated case.

"Their canoes . . . are dug out of a single log. They have no outrigger, and are in consequence liable to accident from want of stability. Great ingenuity is shown in repairing them. We saw a war-canoe which was sufficiently large to be manned by fifty men; it had a prow extending ten feet upwards, which was elaborately carved and decked with tufts of feathers. The paddles have spoon-shaped blades, by which the canoes are propelled with great swiftness." So wrote Wilkes, of the United States Exploring Expedition. His remark concerning spoon-shaped paddles is an error, as also presumably is that making a prow 10 ft. high. He must have been alluding to the stern-piece.

Wakefield has the following note in an account of a visit to Kapiti Island in the early "forties" of last century: "Whare-pouri and several other chiefs came across



[*Tourist Department photo.*

FIG. 12. — TWO FISHING-CANOES FITTED UP AS WAR-CANOES.

Inferior stern-pieces covered with feathers to conceal defects.

from Wai-kanae [to Kapiti] in their war-canoes to see us. Three, . . well manned and armed, came alongside. They look very pretty when at full speed. The finely carved head and stern of the canoe are ornamented with feathers of the pigeon and albatross; and bunches of the latter plumage, or that of the gannet, are disposed along the battens which cover the joint of the bottom and top side of the canoe. . . Two experienced hands in the stern use larger paddles for steering."

Angas, another writer of the same decade, gives us the following: "The canoes are elegantly shaped, and elaborately ornamented with grotesque carvings, painted red with *kokowai;* they have elevated stern-posts, and carry low triangular sails made of *raupo* (a species of rush), and look remarkably picturesque. A fleet of canoes, adorned, as they often are, with the snow-white feathers of the albatross or the gull, and each manned by a numerous band of paddlers, presents a singular and beautiful appearance—gliding swiftly over the waves, and lowering their mat sails as they dart into the bay and run

up on the beach, shooting like arrows through the white breakers. Many of the canoes that arrive at Wai-te-mata from the Thames will carry from fifty to sixty men, who all paddle together, singing in unison some Maori boat-song; their strokes and voices are timed by an individual who stands erect in the centre of the canoe, performing the twofold duty of conductor and prompter; beating each stroke with a staff which he holds in his hand, and prompting the words of the song. The voices of the crew, shouting in measured strain, may frequently be heard when the canoe itself is but a speck on the waves, and the distant sound falls on the ear with a wild and savage effect."

This traveller gives us an illustration of the "low triangular sail" in his works, but does not mention the long upright form of sail formerly used. The Maori employed two forms of sail, as we shall see later on.

The Rev. J. Buller, in his *Forty Years in New Zealand*, remarks: "Building, fishing, hunting, together with the clearing of the forests, the manufacture of their tools, and the moulding and carving of their canoes, were the proper work of the men. Cooking, weaving, and weeding belonged to the women. In cultivating the ground chiefs worked with the slaves. . . They made canoes, some of which, with many hands, took years to finish. The largest of them carried two triangular sails, made of rushes. . . The canoes were of all sizes: the largest would carry one hundred persons. . . If the scene of war was distant they sallied forth in fleets of large canoes. These would hold from eighty to a hundred warriors in each. . . In these canoes they would navigate the coasts, and, in passing from one river to another, would drag them by main force across an isthmus of many miles. It sometimes, but rarely, happened that opposing fleets met each other, and a contest would take place at sea."

Dr. Thomson, a sojourner in New Zealand in the "forties," writes as under:—

"War-canoes for sea navigation are eighty feet long, four feet broad, and four feet deep. Fifty paddlers sit on each side, and three fuglemen stand in the centre of the canoe, exciting the paddlers to exertion by their songs and actions. . . The crew on board war-canoes kneel two and two along the bottom, sit on their heels, and wield paddles from four to five feet along; the steersman, sitting in the stern, has a paddle nine feet long. Over tempestuous seas war-canoes ride like sea-fowl. Should a wave throw a canoe on its side, and endanger its uspetting, the paddlers to windward lean over the gunwale, thrust their paddles deep into the wave, and by a curious action force the water under the canoe. This makes the vessel regain her equilibrium, and gives her a vigorous impulse forward. Even when a canoe is upset, the crew can bale her out and put her right in the water.

"Conflicts in canoes occasionally occurred on lakes, rivers, and creeks. . . Naval engagements were exceedingly rare, as they were alike dangerous to both parties. War-canoes were chiefly used in transporting armies to the scene of action; but when they did meet in strife, the combatants on board discharged their spears, drove their canoes against each other, and then a hand-to-hand fight ensued. The great object in canoe conflicts was to upset the canoes, and kill the warriors helplessly struggling in the water.

"War-canoes were distinguished by well-known names, and when not required they were dragged inland, and carefully preserved in covered sheds. Launching war-canoes into the ocean was heavy work, and there were several chants for the purpose of enabling warriors thus occupied to exert simultaneous efforts. Their songs had various measures, adapted either for pulling heavy or pulling light. For up-hill work there were long-syllabled words in the chants, each of which seemed to issue from the pullers' mouths with the same difficulty as the canoe advanced. But when the hill was crowned, a succession of one-syllable words composed the chant. The first few lines of the chant were sung by one voice, to give notice for all to prepare for pulling. Afterwards, when the pullers had arranged themselves along the gunwales of the canoe, one line was chanted by a single voice while the pullers breathed, and the response was shouted by all who

at the same time pulled together. . . Good singers frequently enlivened the chants with extemporaneous jokes suitable for the occasion."

The width of 4 ft. given for a canoe 80 ft. in length is too narrow; it would probably be 6 ft. wide in the middle, narrowing towards both ends. Again, if in these large war-canoes 4 ft. deep the paddlers either knelt on the bottom or sat on their heels they would certainly not be able to use their paddles. That position was only assumed in small canoes. The larger, top-strake craft contained a deck or floor beneath the thwarts; paddlers knelt on this, or sat on the thwarts. Nor did the Maori rely much on throwing spears: he was essentially an in-fighter.

The following extract from Colenso's essay "On the Maori Races of New Zealand" (why "races"?) is of interest: "If there was much to admire in their house architecture and fortification building, there was still more in their naval architecture—bearing in mind that they did all without the aid of iron or any metal—their solid and strong double canoes (*waka unua*), long since extinct, and scarcely known even by name to the present generation; their handsome, well-arranged war-canoes, of which there are not many, and perhaps not a single first-class one, left; their fishing and voyaging canoes, also with raised sides (commonly called 'war-canoes' by the colonists); and their common canoes of several kinds and sizes, formed out of a single tree, and often of great length. A first-class war-canoe, with all its many fittings, its hundred paddles, its handsome elaborately carved stem and stern, and all its many ornaments and decorations of feathers, rouge, and mother-of-pearl, was always the work of many hands throughout many years. Fully to complete one was indeed a triumph, in which many hands would heartily join. Their largest canoes were rigged with two masts, and carried a large light triangular-shaped sail on each. Their small canoes had only one similarly-shaped sail."

The principal canoe, the most important to the Maori, was the *waka taua*, or war-canoe. Not that such craft were used for war raids only, for they were also employed in voyages and short trips of a peaceful nature, such as social visits. These craft were the result of arduous and long-continued labour, were highly ornate and greatly prized. An old warrior said to me, "This craft, the war-canoe, was man's companion in death, for oft he went to war and died on that canoe."

Some of these war-canoes were looked upon as being extremely high-class vessels, and were *tapu*—such never being used for fishing purposes. Others, again, were of less moment; and, in raiding times, any good-sized fishing-canoe might be used as a war-canoe, and so termed for the time being.

In some cases, when a chief died, his ornate canoe would be dismantled, the hull cut in half, and one-half carved, or painted, or both, and set up as a cenotaph. (See fig. 108, p. 151.) Or, if a capsized canoe, of which the occupants had been drowned, drifted ashore, it would be utilized in a similar manner. There were different forms of stem and stern pieces of these high-class canoes, as will be seen by referring to the illustrations.

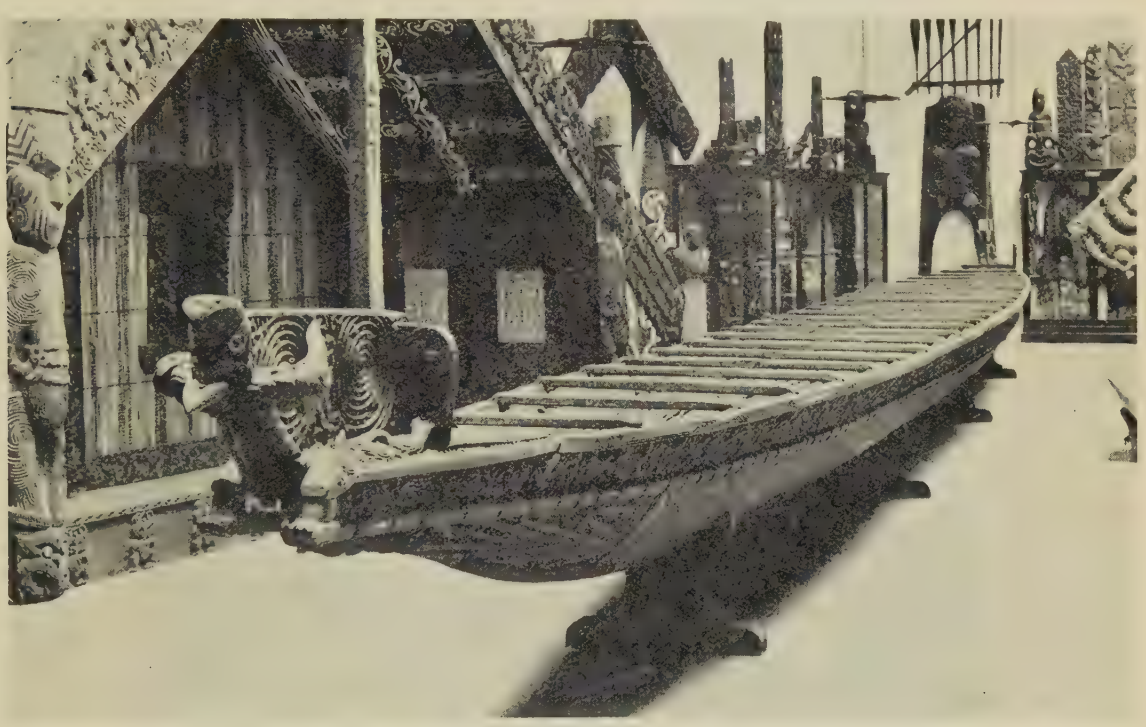
When a *waka taua* or *waka pitau* was used for fishing purposes, the ornamental carved pieces at stem and stern were often taken off and stowed away, and others, such as are affixed to fishing-canoes, lashed on to replace them. This refers to such canoes of this class as were not *tapu*. On being used again for state purposes their proper fittings were replaced.

A canoe might be destroyed, even by persons who held no ownership rights in it, under certain circumstances. For example, when Ta-manuhiri, of the east coast, went a-fishing in a canoe belonging to Kahu-paroro, that vessel became *tapu* on account of the blood of a chief being shed on it, for his nose happened to bleed. He at once returned to land, and his people burned the canoe, the name of which was "Te Mataahi."

A canoe of importance was made *tapu* by the Maori in order that it might retain its *mana*, and to bring it under the protection of the gods. As the Maori puts it, "*Ka purea te waka kia tapu, kia mau tona mana, kia noho nga atua ki te tiaki i te waka.*"

In his account of native wars, published in the *Journal of the Polynesian Society*, Mr. Smith makes the following remarks on Maori canoes:—

The war-canoe of old was a fine sea-going vessel, and, notwithstanding its great length in proportion to breadth, could stand very heavy seas. They were sometimes double, fastened together with cross-ties, but these were rare, though Captain Cook mentions them, and it is known that the Ngai-Tahu people of the South Island used them in their war expedition as late as 1830. They were called *taurua*, *unua*, or *unuku*. Such were some of the canoes in which the ancestors of the Maori crossed the seas from Hawaiki, the "Arawa" being specially mentioned as a *taurua*. The Rev. T. G. Hammond tells me that the "Aotea" canoe, in which came the ancestors of the Patea and other Cook Strait tribes, was a *waka ama*, or canoe with an outrigger. Excepting the "Toki-a-tapiri" canoe, now in the Auckland Museum, there is probably not another specimen of the *waka taua*, or war-canoe, left in the country, and even that is not a first-class one; it is wanting in the handsomely carved *rapa*, or stern-post. These vessels averaged from fifty to one hundred feet in length, with a width of from four to eight feet, and many would carry a hundred paddlers. (See fig. 13.)



[*Brett Printing Co., photo.*

FIG. 13.—MAORI WAR-CANOE "TE TOKI-A-TAPIRI," IN AUCKLAND MUSEUM.

Illustrates prow attachment, painted device under prow, attachment of thwarts and top-strake.

Hoani Nahe describes as follows some of the Ngati-Maru war-canoes of the earlier years of the nineteenth century: "It was Ngati-Paoa and Ngati-Whanaunga who supplied the *waka taua nunui* [great war-canoes] that enabled Wai-kato to escape in the night [after the battle of Tikorauroha]; their names were 'Otuiti,' 'Okunui,' and 'Whenua-roa.' These canoes were very much larger than any I ever saw. 'Okunui' and 'Otuiti' would hold five ranks of men abreast, right from the bows to the stern—a row of men on each side would paddle, whilst three others sat in the middle ready to take the places of those who became tired. 'Whenua-roa' was not so large; only three men could sit abreast on the seats."

A canoe was seen at the Thames some thirty or forty years ago [in 1855] lying in the forest, never having been finished, which measured 110 feet in length, and this was the hull only, without the projecting stem and stern pieces, which in such case would not be less than 15 feet long each.

The old war-canoe was a very beautiful object: painted red and black, with elegantly carved head and stern pieces, the bows adorned with gracefully projecting curved rods, ornamented with tufts of white albatross-feathers, and with white feathers every few feet along the battens which

covered the joint where the solid hull was built up by the top boards. They were very fast, and could, in favourable weather, travel ten miles an hour under the rhythmical dip of over a hundred paddlers. They sailed, too, but not very near the wind. The sails were triangular in shape, with the apex downwards; two were generally carried. The *rapa*, or stern-post, stood up often over fifteen feet in height, and was beautifully carved in delicate spirals, besides being adorned with albatross-feathers. . . Fleets consisting of from fifty to sixty war-canoes frequently left the Bay of Islands in the earlier years of the 19th century bound on warlike enterprises. . . It was not

FIG. 14.—THE "HEKE-RANGATIRA" CANOE, IN THE DOMINION MUSEUM, WELLINGTON.

This is a "converted" fishing-canoe. The top-strake is of European make and woefully inaccurate. (See p. 122.)

the custom to travel by night, though sometimes done, and all cooking had to be performed ashore, for the war-canoes were much too *tapu* ever to carry cooked food in them, or, indeed, sometimes even to carry food at all. For this purpose there were canoes which acted as tenders to the others, often paddled by the women, who frequently accompanied their relations on these expeditions. . .

To each canoe there was one or more fuglemen, *kaituki*, whose duty it was by song and action to give time to the paddlers. They stood up on the bars which served for seats, or on the long

fore-and-aft beam which ran from stem to stern amidships, and there flourished their weapons, accompanying this by one of their canoe-songs, of which there are several still preserved. The chiefs sat in the stern, and sometimes used the powerful steering-paddle, or *urunga*. Running fore and aft was a hurdle-like arrangement of stout *manuka* poles, which served as a deck, on which the paddlers placed their feet, or knelt on, which also served to keep the cargo out of the hold, or *riu*, in which there was always more or less water. In one or two places there was a break in this deck where the scoop-like balers, or *tiheru*, could be used.

The war-canoes were very *tapu;* every step in their construction was accompanied by incantations or prayers said by the priests, part of whose special functions it was to act as naval architects, and direct the whole proceedings, from the cutting-down of the tree to the last finishing adornment of the vessel. In former times, in the first launching of a canoe, the skids were the living bodies of slaves. When not in use the canoes were kept in sheds, or *wharau*.

The projecting stem and stern pieces alluded to as being not less in length than 15 ft. each must be an allusion to the pieces secured to the hull to lengthen it, as in cases wherein a sufficiently long tree-trunk could not be obtained. The "Toki-a-tapiri" is a good genuine *waka taua*, though dismantled for some time in past years. (See fig. 13, p. 33.)

It does not appear probable that the use of human beings as skids in the launching of a new canoe was ever a Maori custom; the evidence is against such a supposition. It was, however, a Fijian practice.

Vancouver remarks that when he visited Tahiti in 1792 he saw not a single specimen of the war-canoes of which Cook had seen so many twenty-three years before. He states that fighting at sea, formerly a common practice, had been abandoned in favour of actions on land.

Here we have an illustration of how in a comparatively brief space of time an ancient practice or usage may be abandoned by an uncultured folk. We also read that the introduction of European boats soon put an end to the use of double canoes on the coasts of the South Island of New Zealand.

Of the large-size Maori canoes Earle remarks: "These canoes are not calculated for sea service in rough weather; as, if poised on a wave underneath the middle, they would most probably snap asunder." It is highly improbable that any such mischance would occur; the Maori dugout was much too strong to render it likely.

We have noted the traditions of New Zealand being first peopled by drift voyagers, and of the arrival of other chance voyagers, as the Ngutu-au people on the east coast and the black folk who reached Whakatane many generations ago. There have probably been other such voyagers to these shores, other ocean waifs who have been driven hither by strong and long-continued winds. Crawford, in his *Recollections of Travel*, &c., states that on a trip from Auckland to San Francisco made in the autumn of 1879 a head wind was encountered all the way from Auckland to Honolulu, "a noticeable fact in connection with the migration of the Maori race and the peopling of New Zealand by it. . . The direction of the wind will explain how canoes, driven off the shores of the Hawaiian or Samoan Islands, may have been accidentally driven as far as New Zealand, although it is difficult to suppose them provisioned for so long a voyage. Possibly the crew provided its own commissariat, and only the survivors landed on the New Zealand shore." There was no need to bring castaways from the far-away Hawaiian Group, but they might well have drifted here from the more southern lands of Polynesia and Melanesia.

PART III.

THE CONSTRUCTION OF THE *WAKA TAUA*, OR WAR-CANOE, FROM TREE-STUMP TO LAUNCHING.

CONTENTS.

Evolution of built-up vessels. Tree-felling. Timbers used. Suitable trees reserved. Special trees named. Superstitions and ritual pertaining to tree-felling. Curious device for tree-felling. Fire employed in tree-felling. The dubbing process. Log-rolling apparatus. *Tapu* of work and workers. Hauling canoe from forest. Hauling-songs. The *waka haumi*. Fitting up canoe. Joining hull sections. The top-strakes. Different modes of lashing top-strakes in Polynesia. Thwarts. Splitting-wedges. The *tauihu*, or carved prow. The *taurapa*, or carved stern-piece. Floor-grating. Canoe-painting. Launching of canoe. Ritual and human sacrifice. Large-sized canoes.

IN describing the various parts of a Maori canoe of the superior type, the use of many native names of parts might somewhat confuse the reader should any desultory description be given. It is therefore proposed, in order to make the description clearer, to construct a canoe for ourselves, and describe all processes of manufacture from the felling of the tree in the forest to the launching of the completed vessel. This method, in conjunction with the diagrams and other illustrations, will, it is hoped, present a fair picture of the Maori canoe.

Acting on the old aphorism that if a thing is worth doing it is worth doing well, it is proposed to so construct a *waka taua*, or war-canoe, as an illustration. By selecting this type we shall be enabled to examine all fittings formerly employed, some of which were not used in connection with inferior vessels. A description of the *waka tiwai*, or plain dugout, would afford no illustration of a built-up craft, or of methods of ornamentation.

Colonel Lane Fox traces the evolution of the built-up vessel from the plain dugout, to which, as time passed, a top-strake was added to give greater height. These were lashed on, and, later, their number increased. As they did so the solid hull diminished in size until it merely represented a keel on which the vessel was built up. Ribs, knees, and framework were added, but the early form of ribs was introduced after the boat was built up, and not set up at first as a framework on which to construct the vessel, as with our modern vessels.

The above-named writer thus describes a process of evolution which is probably fairly correct, though local surroundings have undoubtedly been the cause of modifications and even retrogression in the art of boat-building. Thus the ancestors of the Moriori folk went from New Zealand to the Chatham Isles in a fine type of ocean-going canoe, but when visited by Lieutenant Broughton in 1791 they were using extremely rude craft made of the flower-stalks of *Phormium*, stalks of bracken-fern and seaweed, containing but few pieces of timber. This change was brought about by the lack of suitable timber for canoe-making. Also, we know that Tahitian canoes were built up by securing successive planks to a small dugout hull; but the Tahitians who settled in New Zealand discarded this form and employed big, deep dugouts with but a single top-strake. Doubtless this change was caused by the finding of such large timber in the forests of these isles.

We shall find in our Maori canoe the first crude form from which the essential ribs of our boats were derived, but introduced after the completion of the hull, and in nowise tending to strengthen it.

The practice of lashing parts of a canoe or boat together obtained not only throughout the Pacific, but also in Siam, Burmah, Madras, the Gulf of Oman, the Red Sea, Africa, Tierra del Fuego, and Finland. Lashing preceded trenails.

Banks remarks that the Tahitians worked at canoe-making with incredible cleverness, "although their tools were as bad as possible."

Maning, a very early settler, who knew the Maori as few have known him, wrote: "With rude and blunt stones they felled the giant *kauri*, toughest of pines; and from it, in process of time, at an expense of labour, perseverance, and ingenuity perfectly astounding to those who know what it really was, produced, carved, painted, and inlaid—a masterpiece of art and an object of beauty—the war-canoe, capable of carrying a hundred men on a distant expedition, through the boisterous seas surrounding their island."

Polack, another early sojourner in the North Island, stated that "The natives of the East Cape are noted for their abilities in the New Zealand fine arts; the natives of Hawke's Bay for their ability in making large canoes."

The Rev. Mr. Yate, yet another very early writer, wrote as follows:—

> The canoes of the New-Zealanders were formerly procured only by immense labour, on account of the utter absence of all edge tools, except their blunt-edged axes made of a kind of marble or jasper. When a man required a canoe he had to go to the wood and fell his tree with a small stone hatchet, which preparatory work generally occupied four or five men for two months; after this was accomplished, it had to be shaped into the form of a canoe, which could only be done with great labour. The hollowing, however, was the most tedious task; part would be burnt out, and part would be chipped out with the axes; both with wearisome processes, and requiring much patience. After the vessel was launched, much remained to be done to it; if intended for a war-canoe, two more trees had to be felled, to cut out two planks for bulwarks; and these, when cut, had to be shaped, and fitted on, and then bored with a small pointed stone, for the shreds of flax to be passed through with which it was to be tied or served to the hull of the vessel. This accomplished, an elaborately carved stem and stern-post had to be made, and the whole canoe painted inside and outside with red, and one streak of black over the band which secures the side-boards, or what may be called the gunwale of the vessel: along this band is always laid a number of the gannet's most beautiful white feathers; and on the image placed at the nose of the canoe is fixed a large wig of feathers of the *kaka*, or New Zealand parrot.
>
> These canoes will sometimes contain from eighty to a hundred men: they are rowed with short paddles, a man sitting on each side upon a grating raised about half-way from the bottom. They are tolerably safe, even in a stiff breeze; but, from their great length, they always go through the trough of the sea, and not over the waves. If they went over, poised on the wave underneath the middle, the back of the vessel would, in all probability, be broken. Many have been lost at sea through the ignorance or obstinacy of steersmen. . . Upon any grand expedition they are prepared with the greatest nicety and caution, and every ornament that can be crowded upon them without detriment is lavishly employed. . . A fleet of a hundred New Zealand vessels is a dreadful sight, inspiring, from the shouts of the warriors whilst paddling along, the utmost terror in the minds of those whom they are about to attack. None can view unmoved a hundred of these canoes in action. . . I far prefer the New Zealand to the Friendly Island canoes: the latter, having two lashed together, are far too unwieldly; and, when at sea, are unmanageable. They are decked; have houses erected upon them; and carry between three or four hundred people, besides provisions for this number for several days at sea. I think I have heard them say that, with their means, it requires sixty men to raise the mast, when they wish to set sail.

This extract is from *An Account of New Zealand*, published in 1835. The statement as to the time it took to fell a free is probably an exaggeration, except perhaps in some exceptional cases. For "shreds of flax" read "carefully laid plaited cords." It is highly improbable that the stout dugout hull would be broken if poised on a wave, though some straining of the lashings of the *haumi* and top-strake might result.

In former times it would be reckoned good work to complete a first-class canoe in two years; indeed, some parts, such as the elaborately carved stern and stem pieces, would probably occupy a much longer period.

The best article on canoe-making that has yet come under the writer's notice is one written by "Indigena," and published in the Supplement to the *New Zealand Herald* of the 16th May, 1914. It is too good to be overlooked, and is here reproduced:

A Ngapuhi War-canoe.

By "Indigena."

During a recent visit to the Bay of Islands I obtained from an old identity, Mr. J. A. Bedgood, of the Kerikeri district, an account of the fashioning and equipment of a Ngapuhi war-canoe in the days when no modern implements were to be had. In the working-out of the details we also had the help of one of the foremost chiefs of the tribe, an old-fashioned *rangatira* nearly seventy years of age.

The first thing was the choice of a tree. In the north, among the Ngapuhi [Tribe], the *kauri* was likely to be used for the large war-canoe. The location of the monarch of the forest did not matter; whether it stood on hillside or ravine, there would be an abundance of brute force wherewith to haul it to more level ground and to the tide. But how was a trunk six or seven feet through to be felled with stone axes? Well, little by little can accomplish much. When the undergrowth had been cleared away, and perhaps a rough staging erected, an attack was made. About eight men got to work on a scarf of about two and a half feet. They worked in pairs. Number one with direct blows bruised the top line and the bottom line of the scarp; then number two tore out the intervening strips with an axe fixed to work adzewise; number three bruised and number four adzed, and so on. It was slow work: each pair of men could not eat in more than about half an inch at a time. With relays of hewers it would take, say, a couple of days to get the tree down. Then the head had to be taken off. A fire of *tawa* logs was made, and burning brands were carried and placed crosswise on the tree, the flame being also fed with smaller sticks. When the fire had eaten into the trunk an inch or two the remnants of the sticks were pulled away, and the charred part, when cooled by water so that the tools might not be harmed, was adzed out: this process was quicker than waiting for an entire burn through. Thus by degrees the head of the tree was severed from the trunk. Whenever fire was used for such a purpose, water was kept at hand to prevent it from burning too far. I may mention, in passing, that the method just described was also used in the obtaining of lengths of tree-trunks wherewith to construct the palisading (stockade) of a *pa* (fortified village).

Before the process of turning the mighty log into a canoe was begun, a solemn ceremony was conducted by the *tohunga* (wise men, priests). With old-time incantations or *karakia* the log was made *tapu*. The workers, say some twenty or more, were also *tapu*, as in the case of workers at the *kumara* crop. The *tapu* was put on them after they had had their morning meal, and was taken off each evening. They had no midday meal; and if, when knocking-off time approached, some specially important piece of work was still in progress, then, according to ancient custom, they had to keep on without food until it was completed, otherwise ill luck would be brought on the undertaking.

Before any further proceedings it was necessary to examine carefully the shake, or crack, that every tree, as a rule, is found to have running lengthwise through the centre of it. The log had to be worked so that this shake might be at right angles to a vertical section of the canoe; and fortunate indeed it was when it ran above the future water-line at bow and stern. When the log had been placed in the right position the top side of it was laboriously levelled with adze-work to gunwale-height, and then the outline of the top of the canoe was sketched. Next came the hollowing-out. Fires of *tawa* or of *taraire* wood were made close by, and the fire-sticks were laid on the log: then the charred part was adzed out, and so the interior was slowly fashioned out. At the same time some of the workers were busy on the exterior, shaping bow and stern, taking off excrescences, and generally bringing the sides of the log nearer to the required form. When the hollowing-out was finished the log was turned over, so that the bottom of the canoe could be shaped. Other workers, again, were busy preparing long slabs or planks to form the topsides. These were, among the Ngapuhi, obtained from the *rimu* tree. This was also a work of patience, what with the felling, &c., the splitting with wedges of *puriri* or *maire* [hardwoods], the adzing of the surfaces, and in some cases the adornment of the planks with carvings. And yet again the carvings for the ornamentations of bow and stern meant long labours. If, for example, they were of *totara*, only a small portion could be done at a time, lest the wood should split. Thus many operations were being carried on simultaneously; and they were all directed and superintended by a chief who had graduated as an expert in the high craft of war-canoe building.

In some cases his skill was taxed in another direction. As the hollowing-out proceeded, the working of the shake when it touched the water-line forward, let us say, was not very marked; then the canoe, when it reached the shore, was filled with *tanekaha* bark and water, and left alone for a month or two. By the end of that time the tanning-material from the bark had effectually filled up the crack. But if the shake was serious, other measures had to be taken. The fore part, for example, of the canoe was cut off; a V-shaped projection was left at the bottom. Then a bow-piece, perhaps of some length, was brought up to it with a corresponding V-shaped notch. The nicety of the fit was carefully tested with *kokowai*, in the way known to all acquainted with dovetailing; and then with *koreirei* (rootstock of *raupo*—*Typha angustifolia*), inset wherever the edges of the two sections

met, the junction was made. Next the permanency of the craft was ensured with firm lashings of *kiekie* root, or of twine made from *Phormium* fibre; and, lastly, *hune* (the down surrounding seeds of the *raupo*) was used for caulking the seams, being driven in with a *maire* or *puriri* wedge. This caulking-material was always carried in the canoe, wherewith to check any leaking of the joints. Thus, while the hull of the canoe might be all one piece, it might have a bow-piece, and perhaps also a stern-piece, that had been deftly and securely welded on, as it were.

And now at last the bare hull is ready for its overland journey, perhaps as long as fifteen miles, to the tide. But steps must be taken to guard it from accident and to bring it good luck in its career. The tribesmen muster; a feast is spread, and a portion of the food is placed in the bow of the canoe. Then the woman of the highest rank in the tribal division interested in the craft mounts into the canoe and eats the food. When she has finished and has stepped out, the hauling seaward can begin. Some ropes made of the leaves of the *ti* tree (*i.e.*, the cabbage-palm) were attached at the bow and on each side; skids of green wood, preferably the trunks of *ti* tree (*Cordyline australis*), were placed in position. Some of the men hauled, others made it their chief object to keep the canoe upright, and others again saw to the skids. The route chosen was the easiest obtainable, but it generally had to be up hill and down dale. Relays of men furnished motive power, and time was generally no object. About three or four miles might be covered in a day, while in difficult country progress would be much slower. In the shaping of the bottom of the canoe, the wearing-away by the friction of the haulage was allowed for; but, if it did not come up to expectations, then, at one of the halts, more was chipped off with the axe (adze), and thus the weight was lessened.

When the salt water had been reached the final fitting-out was proceeded with. The topside planks were lashed on and the seams caulked in the manner above described. In all cases the lashings were passed through small holes bored with pieces of sharp flint called *tuhua*. The handsomely carved bow-piece or figurehead, and the stern-piece, were also fixed in position, The only decking was a grating made of sticks lashed together and resting on cross-pieces supported by long rests on each side running the length of the canoe. There were holes at intervals for bailing out water, and for other purposes. It is interesting to note that in the splendid specimen in the Auckland Museum, the "Toki-a-tapiri" (which, by the way, comes from Hawke's Bay), the lashing that binds the topsides to the hull also holds in position the long rests inside and the long strake-pieces (covering-battens) outside. The thwarts, which were lashed across on top, each consisted, among the Ngapuhi, either of two or three sticks placed close together, or of one stout piece, as in the "Toki-a-tapiri."

At last the time for launching has come. With solemn formula chanted by the priest the canoe is thrust into the water. Then, laden with its full complement of men—paddlers and others—and with additional weight equal to that of the weapons and stores usually carried, it had to pass a test of efficiency. If the wake it left followed the canoe too much, this showed that it was not shaped so as to cut through the water well and swiftly. Accordingly it was turned upwards in shallow water, and the hull was adzed and chipped until the required result had been obtained. Not until it was a finished and perfect craft were the decorations of *huia* [?] feathers mounted at the bow and at the stern.

One of the very last things was to paint the canoe. Most of the hull received two coats of red paint, made of *kokowai* (red ochre) mixed with shark-oil; for the rest black was used. To obtain this a fire was made with heart of *kauri* or of *rimu*, or of both, and a kind of plank was placed over the smoke to catch the soot; this, carefully scraped off and mixed with shark-oil, supplied the ebon hue. The carvings might also be partially or wholly blackened. In the "Toki-a-tapiri" the ends of the craft are black, diversified with curves and figurings in red.

In the above article we have as good a description of the making of a canoe as could be given in the space occupied. It is assuredly the best yet published. We would have welcomed an explanation of the hafting of the tool used in bruising the top and bottom lines of the scarf: probably it was hafted axially on a fairly long shaft, as was done in other districts. The felling of a tree 7 ft. in diameter in two days by this process would certainly be very quick work. Old natives usually say that the task occupied about five days, and even that seems but little when considering the extremely primitive methods employed. In regard to the procuring of long planks for top-strakes, it is doubtful if the Maori ever succeeded in splitting a large log 50 ft. or 60 ft. in length; on the contrary, each plank was hewn out of a solid log by a slow process of dubbing down. The securing of ropes for hauling is not clear, but apparently three were used; and the writer gives no account of the hauling-songs chanted by fugleman and workers, by means of which concerted action was gained. The dovetail employed in fitting together the parts of a composite hull was usually rectangular, not V-shaped.

Again, it is doubtful if *tuhua* (obsidian) was employed for drill-points or chisel, being much too brittle for such a purpose. *Mata* (flint and chert) or *kiripaka* (quartz and quartzite) were used for such purposes.

Thwarts consisting of several sticks would certainly not be employed in any superior canoe. The remark concerning the decorations of *huia* feathers must be looked at askance. These birds were found only in the southern part of the Island; a few of their plumes (tail rectrices) reached the Ngapuhi district, but would probably be used only as head-ornaments.

A brief account of the making of a canoe, contributed by Mr. Barstow, was published in volume 11 of the *Transactions of the New Zealand Institute.*

We will now accompany our Maori friends to the forest and observe their labours from the selection and felling of the tree through the processes of dubbing down, hollowing out, hauling from the forest, and fitting, even to the launching of the vessel; after which we will note methods of propulsion, and make a voyage across the Great Ocean of Kiwa in order to observe the forms and manipulation of deep-sea-going vessels.

The timbers used in canoe-making were *totara* (*Podocarpus totara*), *kauri* (*Agathis australis*), *mangeao* (*Litsaea calicaris*), *rimu* (*Dacrydium cupressinum*), *kahikatea* (*Podocarpus dacrydioides*), *matai* (*Podocarpus spicatus*).

Of these timbers the first two were the most highly valued, and *totara* the most commonly employed, its distribution being a wide one, while the *kauri* pine is confined to the northern part of the North Island. The other timbers named were employed in cases where neither of the first two was available. Colenso, a very early settler, wrote: "For canoes, the natives from the Thames northwards generally use the *kauri*, and the southern natives the *totara*, which was preferred by all; the *kahikatea* was also often used for this purpose . . . for the carved figureheads the *pukatea* was generally used, while the ornamental carved work of the sterns was made of *mataii* or *totara* . . . canoe-paddles were made of *manuka*."

The author of *Maoria* speaks of "*mangeao*, that incomparable timber for canoe or boat building. Light as a cork, tough and durable as oak, no timber floats like it." Its, range, however, was restricted, and it was a much more difficult timber to work than *totara* or *kauri*. Occasionally drift logs of a suitable kind were found in rivers. In an article by "Crayon" in the *New Zealand Journal* of 1842, the writer, in describing native industries, says: "At other times the men are employed in making seines for fishing, in making canoes, raising *totara* trees of immense size from the depths of rivers for that purpose, where they have been embedded from time immemorial."

On the east coast *totara* was the principal timber used in canoe-making, the *kauri* tree being confined to the northern part of the Island. *Rimu*, *kahikatea*, and *matai* (*Dacrydium cupressinum*, *Podocarpus dacrydioides*, *P. spicatus*) were also occasionally used. There was a canoe made of the latter timber in the Wai-kare-moana Lake some years ago.

Adepts selected a tree when a canoe was to be made, and such men could tell, by looking at a tree, whether the trunk thereof was sound or otherwise, as can experienced white bushmen. They would not fell a tree that would be likely to be broken in its fall, or to fall in a bad position. When a suitable tree was selected, the brush and small trees were cleared away from its vicinity, as a sign that the tree was *taunahatia*, or bespoken for use, and such a marked tree was sometimes left standing for many years. For when a desirable tree was noted it might be so reserved for canoe-making, or other uses, in the future, though no timber was required for such purpose at the time. The fact that the tree was reserved was also made public, that all might know, and then no one would interfere with it. Among the Tuhoe Tribe a fine, straight-grained tree of white *tawa*, suitable for the manufacture of bird-spears,

was often reserved in a similar way. Any person seeking such a tree, and seeing one from which the surrounding brush had been cleared away, would at once know that the tree was reserved. When, however, such a *tawa* tree was finally felled in order to make a bird-spear, then other folks might come and ask for a part of the split trunk wherefrom to make for themselves a like implement.

In some cases a man might repeat a charm over such a reserved tree in order to preserve it from the elements—*koi tukitukia e Tawhiri-matea*—lest it be destroyed by Tawhiri-matea (personified form of winds).

These reserved trees seem to have been alluded to as *taipua* by the natives, as in the following sentence: "*Ka mea a Puhi kia tikina te taipua a to ratau tipuna kia tuaia ki raro, kia taraia hei waka*" ("Puhi proposed that the tree bespoken by their forbear should be felled and fashioned as a canoe"). Evidently the word *taipua* is a variant form of *taupua* (to bespeak).

In some cases, when a *totara* tree suitable for canoe-making was found, a strip of bark was peeled off one side of the trunk. One authority says that it was taken off the east side of the tree, and this caused the wood to decay along that strip. After many years, when the tree was felled in order to be converted into a canoe, the decayed part would much accelerate the task of hollowing out the trunk. Such well-known trees, as also others utilized by fowlers, were often given special names by the Maori, as also were groves or clumps of trees in some cases. Thus, Te Whanau a Mihi (The Offspring of Mihi) is the name of a group of *totara* trees near Nga Putahi, in Te Whaiti district; while Te Hokowhitu a Ngai-Tawha is a grove of *ake* trees on the Whirinaki River. The tree from which the famous "Takitumu" canoe was made was known as Te Puwhenua.

In volume 11 of the *Journal of the Polynesian Society* Mr. Tone has a note to the effect that in former times it was a Maori custom to take a strip of bark off one side of well-grown young *totara* trees "in such a manner that, as they grew up, a portion of the sap would be exposed, and this part would gradually decay and a large hollow result, thus greatly facilitating the work of fashioning a canoe." This statement was corroborated by two persons who had seen trees so treated. One observer had seen a whole group of *totara* trees so marked; the process was to cut off a strip of bark about 3 ft. long and 1 ft. wide, and to chip the exposed sap-wood. Most of the trees were dead, or hollow, on the wounded side. The late Mr. John White also collected some information concerning this custom of wounding trees selected for canoe-making. That indefatigable collector also preserved the following: "When a person is about to enter the forest to seek for a tree suitable for a canoe, the principal *tohunga* [priestly adept] recites over him a charm known as *Kimihanga*, or 'Seeking.' While the workmen are engaged in cutting and burning the tree down, the *tohunga*, at some distance from them, recited the *Ru-nuku* charm."

In his paper on the Maori canoe Mr. Barstow says: "Canoes, being of vital importance, whether for war or as a means of procuring food, a superstitious race naturally attributed to the tree set apart for the *hiwi*, or hull, of the canoe some power over its future fortune; not only was a particular site or aspect in its growth deemed lucky, but it was supposed that incantations by a *tohunga*, or wizard, bestowed upon the living tree would increase the virtue of the wood when used. Special trees were sometimes the cause of war between two tribes; were set apart, or made *tapu* by a father for an infant son; remained even as an heirloom for the grandson; and occasionally, in early land-sales [to Europeans], were specially reserved."

A suitable tree was sought for in canoe-making—a straight, sound trunk of the desired size, independent of its situation. Probably several adepts would examine it, and also the route by which it would have to be hauled from the forest to the waterside, ere it was decided to fell it. Some of those hauling-routes by which heavy half-hewn hulls

of great length were dragged over rough hilly country would strike dismay into the hearts of European workmen. Canoes were sometimes so hauled for many miles.

The size and form of a canoe about to be made were decided by verbal discussion and description: no form of plan or sketch was employed.

The following remarks were made by Tuta Nihoniho, of the Ngati-Porou Tribe: "When timber was required for house-building, canoe-making, or other purposes wherein was expended much labour, the trees were felled in the autumn. In the previous spring a crop of food would be planted near the spot, if possible, in order to save the labour of carrying it to the scene of operations. When this crop was lifted, then the people moved to the spot, erected huts, and the labour of tree-felling commenced." Nihoniho does not know that his ancestors had any idea that winter was the best time at which to fell timber, in regard to sap-movements; they commenced operations in autumn on account of the food-supply being ready at that time. When felled for a canoe the tree would probably be hewn into form at once, but sometimes, when first-class stone adzes were not available, it would be allowed to lie for several years, until partially dry, when burning operations had more effect.

Another old native supplies the following: "When it was decided to fell a large tree wherefrom to manufacture a canoe, it often occurred that such tree was situated at some distance from the village home, hence the people—men, women, and children—would move to some suitable spot near the scene of operations, and there live in temporary huts during the continuance of the work. In many cases a piece of ground was cleared, dug, and a crop planted in the vicinity of such a work-camp, that food might be plentiful and handy. Also they would rely to a certain extent upon the products of the forest, stream, or sea." These temporary encampments while canoe-making, fishing, bird-snaring, rat-trapping, &c., were much enjoyed, apparently, by the natives.

Mr. Barstow gives us a note about tree-felling in his paper on "The Maori Canoe": "The next step was to consult the *tohunga* as to the day for commencing the felling of the tree. The state of the moon must be considered; an inauspicious day for beginning would surely cause the canoe to capsize, the war-party using it to be defeated, or, if not a war-canoe, no fish would be caught therefrom." This reliance on the moon in tree-felling we have no corroboration of, but such quaint beliefs were essentially Maori.

We have now to consider, ere felling our tree, a curious and interesting phase of Maori mentality, as evinced in his mental attitude towards Nature, and in particular towards the forest and the trees therein. That attitude can be almost summed up in the use of the term "animatism." The Maori is by nature a mystic. When abroad in the fields, woods, or mountains he is not surrounded, as we are, by inanimate objects—he dwells in a world in which nothing is inanimate. The trees, plants, birds, fish, insects, rock, stones, and other natural objects around him are not only possessed of a soul or spirit, they are also, together with man, of a common origin: all are descended from the primal parents, the Sky Father and the Earth Mother. He proves this by relating the table of descent from the primal twain, thus making clear his position. Ever remember that the Maori has the mythopoetic nature of folk who have clung to the breast of Mother Earth for many, many centuries; his mentality has nothing in common with that of your town-dwellers. When he enters the forest he is among the offspring of Tane the Fertilizer, from whom he also is descended. He is among his own kindred, the descendants of the elder branch of his family, begotten by their common ancestor Tane, and under his protection. Thus when man, of the younger branch, wishes to slay a member of the elder branch—that is to say, when he desires to fell a tree—it is necessary that he should avert ill consequences by a placation of Tane, the progenitor of trees and of man.

The following account of the ritual connected with tree-felling was communicated to the writer by Tutakangahau, of the Tuhoe Tribe, a man who possessed much knowledge of the customs and practices of his ancestors :—

These remarks concern certain works performed by the hands of man. A person desires to make a clearing in the forest, or to fell a tree for a canoe, or for house-timbers, or for some other purpose. In the early morn he goes to the forest. He fashions a certain contrivance in the form of an adze by means of fastening a leaf to the end of a stick ; it is the semblance of an adze. He then prepares

[*Sketch by A. H. Messenger.*

Fig. 15.—The Ahi purakau Ceremony.

for his task by donning a girdle [in performing any ritual the Maori discarded his garments], at the same time repeating—

Kai te hiahia [*A desiring*]
Kai te koronga [*A wishing*]
Kai a Tane. [*For Tane.*]

He then, with his semblance of a felling-tool, strikes the trunk of the tree that he desires to fell—though, of course [as my informant put it], no chips will fly by using such a tool. He then recites the following :—

He ao pukapuka
He ao mahamaha
He toki henahena
He toki ta wahie
Ka pa ki tua, ka pa ki waho. ka pa ki a Tane.

As he repeats the last words, "It strikes Tane," he strikes the first blow on the trunk with the real felling-tool. When the first chip flies he desists from work, picks up the chip and takes it with him into the forest, leaving a companion to continue the chopping at the tree. Bearing his chip away into the forest, the man at length stops to listen. Should he hear the sound of the tool striking the trunk he again moves on, to stop and listen once more. When he can no longer hear that sound he halts and kindles a fire by the *hika*, or rubbing, process. This fire is termed the *ahi tumu whenua*. As the fire burns up he places the chip in it, and chants—

Hika ra taku ahi
E tumutumu whenua
E aneane whenua
E raro timu, e raro take, e Hawaiki
Ka hika ki te ihi o Tane
Ka hika ki te mana o Tane
Noho mai i tua na
E tapu ana Tane
E maota ki te rangi o Hawaiki . . . e!

Such is the *tumutumu whenua* rite; the chip is burned in this fire. This ritual performance and the chip are for the gods.

The adept now returns to his companion at the base of the tree. The chopping at the trunk continues until many chips are collected. Another fire is then kindled by friction near the tree. This is the *ahi purakau* [*ahi* = fire]. The chips are burned in this fire; food is cooked. This is for the purpose of taking the *tapu* off, that the proceedings may be free from *tapu* [to remove all restrictions]. This rite is to [placate] Tane; the other, the *tumutumu whenua*, was to the gods. Now the adept chants the ritual of the *ahi purakau*:—

Hika ra taku ahi, E Tane!	[*Generate my fire, O Tane!*]
Hika ra taku ahi, E Tane!	[*Generate my fire, O Tane!*]
He ahi purakau, E Tane!	[*A* purakau *fire, O Tane!*]
Ka hika i te ihi o Tane	
Ka hika i te mana o Tane	
Ka hika i te marutuna o Tane	
Ka hika i te maruwehi o Tane	
Ka hika i te pukapuka o Tane	
Ka hika i te mahamaha o Tane	
Ka kai koe, E Tane!	[*You will eat, O Tane!*]
Ka kai hoki au, E Tane!	[*I also will eat, O Tane!*]
Ka mama nga pukenga	[*Thus will the teachers be freed*]
Ka mama nga wananga	[*Thus will the wise ones be cleansed*]
Ka mama hoki ahau, tenei tauira.	[*As I also, this disciple, will be freed.*]

This rite takes the *tapu* off Tane [*i.e.*, off his offspring—trees] and placates him; it prevents him punishing the tree-fellers; it prevents breakage of the stone tools, and accidents among workmen. The placation of Tane frees man from many ills and averts disaster.

When the food [for the ceremonial feast] is cooked, then the *taumaha* rite is performed. The priestly adept takes a small portion of the food and chants over it the following ritual, even as you white folks repeat a prayer ere partaking of a meal. This not only completes the lifting of the *tapu* from the food, the work, and workmen, but also acts as a *pou* [to support and impart energy to the workmen]; it wards off evil influences and sickness, or misfortune; it prevents workmen becoming listless or unduly wearied. It also renders them intelligent and clear-minded in regard to their work, and it pertains to Tane. Here follows the *taumaha* ritual:—

Tenei te pou ka eke
Te pou kai a koe
Ko te pou o tenei mahi
Tiaho i roto, wananga i roto, korero i roto
Tena te umu, te umu ka eke
Ko te umu o tenei whaihanga
Ka ma taku hau tu
Ka ma taku hau mahi
Ka ma moe tu, ka ma moe rere
Ka ma moe te whakaarahia
Whakaarahia i te ata hapara
Ka mau tatua mau wawe i te ata hapara
Ka ma nga pukenga
Ka ma nga wananga
Ka ma hoki matau, enei tauira.

This rite has the effect of removing the *tapu* pertaining to the proceedings and to the food. The people can now partake of the prepared food and commence the task of felling the tree.

Such was the peculiar ritual pertaining to tree-felling, as practised by the Maori in former times. Its object was to placate Tane, the progenitor of trees and tutelary deity of forests, as also other gods of the Maori pantheon, that no harm might come to the people who were about to slay one of the offspring of Tane. The first-chanted ritual, and its accompanying sacred fire, was directed to the gods; the second was connected with Tane; the third lifted the *tapu* or restrictions, and enabled the tree-fellers to proceed with their labours.

In connection with this curious mental attitude of the Maori towards the forest and the trees thereof the writer can recall many a quaint episode of a long sojourn in the bush. When a giant tree thundered to earth, natives would remark, "*E! kua hinga a Tane*" ("O! Tane has fallen"). When passing natives observed the narrator busily engaged in felling a tree they would call out, "*E tama! Kei te raweke koe i to tipuna, i a Tane*" ("O son! You are meddling with your ancestor Tane").

A singular ceremonial act was performed when a tree was felled: it consisted of laying fronds of certain ferns upon the stump. The fronds of the *mauku* (*Asplenium bulbiferum*) and *paretao* (*Asplenium falcatum*) were so employed. One authority states that a piece of the fern was cast into the *purakau* fire, and another piece fastened to the canoe-hull when dubbed out. Presumably these were viewed as offerings to Tane.

Again, in the old Polynesian story of Rata we have an illustration of how vain is the labour of man if he be not assisted by the gods. Rata fells a tree in order to make a canoe, but fails to perform the necessary placatory rite, hence when he returns to the forest next morning he finds the felled tree restored to its stump in its original position. He again fells it, and again he finds it a growing tree in the morning; hence he lies in wait after felling it a third time, and observes the coming of forest elves, who chant a certain charm, whereupon the prostrate trunk is restored to its stump as before. Rata remonstrates with the forest folk, who reply, "It is not your tree. You did not tell us that you wished to fell a tree. It is for us to consent to your cutting the throat of your ancestor Tane." Then they tell him to fell the tree and cover the stump with the *paretao* fern. He does so, and is so permitted to make his canoe.

The following item from Crooke, given in the *Handbook of Folk-lore*, shows a Maori custom in India: "The Maghs, a jungle tribe of Bengal, are most unwilling to fell trees. Nothing but positive orders and the presence of Europeans would induce them to do so. On felling any large tree, one of the party was always ready prepared with a green sprig, which he ran and placed in the centre of the stump, when the tree fell, as a propitiation to (or rather as a new home for) the spirit which had been dislodged so roughly, pleading at the same time the orders of the strangers for the work."

The story of the adventures of Rata is one of much interest, but all too long to relate here in its entirety. In the longer version preserved on the east coast Rata goes to his mother in his dilemma, and she advises him to go to Ahuahu and consult his elder Whakaiho-rangi, a warlock of weird powers; whereupon the following conversation takes place:—

"Inasmuch as you are seen here, what is the purport, O lad?"

"I am distressed concerning my tree. Three times have I felled it and three times has it been restored to its stump. Supernatural beings are meddling with it—a numerous folk—the forest is full of them."

"Nay, my son, those are but your elders."

"Whence come they, and where is their home?"

"They haunt the realm of Hine-moana and mountain-summits; in *tapu* places they dwell and move, in the regions that give upon the underworld; they move upon the breast of the Earth Mother; ever, in light and darkness, they pursue the arts of peace and pleasure."

"And how may I secure my tree?"

"Go! Fell it once more, then cover the stump with *paretao*, and, when night falls, bring it to me at the *tuahu*."

Even so Rata took the offering to the place where such rites were performed, and handed it to his elder, who held it forth in his hands and waved it toward the gods, as he chanted the following ritual:—

Whiwhia, whiwhia
Tau atu ki nga tupaki, ki nga tihi
O Hine-moana, o Tuanuku
He aro, he aro tipua, he aro atua
Tenei au he uhenga a Nuku, he uhenga a Rangi
Ki tenei pia, ki tenei taura
He aro tipua no runga no te toi huarewa
No runga no te toi matua
No te toi atua ki tenei pia
He pia tipua, he pia atua no nga rangi tatara
Ki te pu, ki te weu, ki te akaaka rangi . . . e . . . i.
Tenei au he uriuri, he pia no nga rangi tatara
Ki take rangi, e Io . . . e . . . i.
Tau tika, tau aro mai ki to pia
He pia tipua, he pia atua nou, e Io . . . e . . . i.
Tenei au kei te uruuru tapu, kei te uruuru rangi
Kei te uruuru i te wao tu a Tane
Ki te pungakengakenga o tau tika, o tau aro
O tau mai ki tenei tama nau, e Ruatau . . . e . . . i.
Hapai ake nei au i taku toki
Ko te Haemata o te rangi
Hapai ake nei au i taku toki
Ko Te Rakuraku a Tawhaki
Hapai ake nei au i taku toki
Ko Pukupuku te rangi
Hapai ake nei au i taku toki
Ko Manu-tawhio-rangi
He toki tipua riki (?), he toki tipua rangi
He toki tipua no nga atua
Ka whakapirihia ki a koe, E Tane-tuturi!
E Tane-turere! E Tane-whirikaha!
E Tane-torokaha! E Tane-puhau rangi!
E Tane te waotu, e!
Tenei ka tau, ka tau ki raro ki tenei tipua
Ki tenei tawhito, ki tenei pia uriuri nou
E Tane-matua . . . e . . . i.

These cryptic effusions are most difficult to translate, the assistance of an adept being necessary. It is interesting to note that Io, the Supreme Being, is appealed to in this ritual, as this fact shows that the felling of a superior tree for an important object was deemed a serious matter, for Io was appealed to only in matters held to be of supreme importance. In explanation the narrator of the legend remarked, "This ritual was employed by priests when a superior tree was felled to be fashioned into a war-canoe, a ridge-pole for a superior carved house, a carved stockade-post, or a mortuary memorial."

Other supernatural beings mentioned in the above are Ruatau and Tane, the latter being viewed as the origin of trees and the tutelary deity of forests. The stone adzes mentioned—Te Haemata o te rangi, Te Rakuraku a Tawhaki, Pukupuku te rangi, and Manu-tawhio-rangi—are spoken of as *tapu* implements, used only on important occasions.

The following account of the native style of tree-felling was written by "W. B.," of Te Kuiti: "First the lean of the tree was debated. That settled, two posts were fixed in the ground on the first-scarf side—the side it would fall to—the width of the tree apart, and of height to allow for a scaffold upon which the labourers may stand.

From post to post a straight rail was tied, to rest the axe-helve upon—which axe was not helved like the white man's, at right angles, but firmly bedded and lashed in a recess at the end of the helve-pole with strong sennit. Then four slaves grasped the pole and, using the rail for a rest, butted the axe at the tree, across the grain, with might. A hand's breadth higher another groove was thus graven, and the intermediate wood pecked out with a narrower adze. When the master adjudged the depth to be just, the rail was raised half a man, and a similar groove graven, and the block between scooped out with the same tool on edge; and, if the scarf was deep enough to house a fire, such was employed to char the wood. Then the other scarf got attention, until the tree fell."

The following notes on tree-felling were collected by the late Mr. John White: Before the tree is felled all undergrowth and rubbish is cleared away from beneath it. As the tree was felled in the *poike*, or peg-top, style, it was often unknown which way it would fall. While the tree was falling the *tohunga* repeated the following charm to cause it to fall gently and so prevent breakage or splitting:—

Tena te ara, te ara ka iri
Ko te ara o Tane
Tane i te pu, Tane i te aka, Tane i te tamore
I tupu ai te whanaunga ariki
E Tane whiwhi make ngutaha ki te ra (?)
Tena te ara, te ara ka iri
Ko te ara o Tane.

This charm was recited only when the tree was to be fashioned into a *waka taua* or *waka mamae*. The latter term is applied to a canoe that is made in remembrance of some respected chief, or a loved relative, perhaps a wife or child.

All those who work at the canoe wear but one garment whilst actually at work. Such garments are made specially for the occasion by old *ruahine* or *tapu* women, out of flax specially procured for the purpose. When quitting work for the day these garments are left near the canoe. This is a precaution, for should any chip or fragment of the worked tree adhere to such a garment and by any means get into a fire used for cooking the people's food, then all the people would die. It would result in an antagonizing of Tangaroa and Tane—hence disaster. All food for the workmen must be cooked apart from that intended for the bulk of the people, and may not be partaken of by the latter. These workmen are under the sway of Tangaroa while engaged in their task, but are working within the realm of Tane, hence great care must be taken. To offend Tangaroa was dangerous, inasmuch as the lightest trouble that would ensue was that workmen would cut themselves with the tools. Such would be the result of any non-worker eating a portion of the workers' food. Any residue left by the workers at the meal would be eaten by them at the next, ere they began to partake of the fresh food cooked. No one but the special cooks told off to cook for the workers may touch the fire at which such cooking is done. New fire must be generated each time that food is cooked for the workmen. Such food must be eaten in the forest at some distance from the canoe.

Should a person of another *hapu*, or clan, wish to observe the canoe as it is being fashioned, he must, as soon as he comes in sight of the operations, repeat the following in a loud tone as he approaches with a spear in his hand—

Huakina! Huakina!
Huakina i te ata tapu e mata koe
E huaki te mata tapu e ai
Ko marama hake [maranga hake?]
Ko marama te ati tipua
Ko marama hake te ati tawhito
E hatiotio, e hatiotio.

So soon as the workers hear the voice of the visitor they cease their labours. When the visitor has finished his speech he throws his spear at the canoe. Should it strike the canoe, the fact is an omen of success for the men who man her in the next raid. Should the spear pass over the canoe or strike the ground below or before it, defeat is assured in such raid.

As many as twenty persons would engage in the task of felling a tree for a canoe. *Toki uri*—that is, stone adzes—were used in the felling. It would take these men two or three days to fell the tree, and four or five days to cut off the head of the tree when felled. When severed, then the log was turned with levers. When hollowed out as to the *riu*, it was then hauled to the village home and there completed.

Trees were certainly not always felled in the peg-top manner, though such a usage may have been common in a certain district. (See fig. 19, p. 52.)

In Roux's "Journal of the Voyage of the 'Mascarin,'" published in volume 2 of the *Historical Records of New Zealand*, are a few remarks on tree-felling by the Maori as observed in 1772. In one part of his journal this writer remarks, "Nowhere could we find, however, any trace of metals. We noticed trees cut into a triangular shape, as with us." Later on he says, "They make their tools out of a very hard stone which resembles marble, and which is very black and very hard. Of this they make their hatchets and adzes. The first they use for cutting down trees, but it is only after a good deal of trouble that they succeed. In order to lessen the work which this operation entails they hollow out the earth all round the tree which they wish to fell, and then set fire to it, taking care at the same time that the flames shall only burn the foot of the tree. When they have thus felled the tree they roughly hew it with their hatchets and smooth it down with their adzes. These stone tools cut fairly well."

This account seems to refer to two different methods of tree-felling—that by means of cutting kerfs in the trunk, and that by burning the uncovered roots of the tree. Another interesting remark is that wherein two different forms of stone tools seem to be referred to—hatchets and adzes. The former is distinctly said to have been employed for tree-felling and in the rough-hewing of the log, while the adzes were used in dressing the surface to a fine finish. It is much to be regretted that no explanation is given of the modes of hafting the two forms. The Maori possessed no tools with which to cut a V-shaped kerf in a tree-trunk, as we do with steel axes.

Forster mentions having seen a native using a stone axe in felling small trees at one of the New Hebrides isles: "The tree was not so thick as a man's thigh, and yet it was a very laborious undertaking, with such a tool as this hatchet, to cut it in two. . . He had already cut down a quantity of bushes, which lay in heaps."

Fire was very generally used in tree-felling. In Turner's work on Samoa we find these remarks: "They felled their trees by a slow fire close to the ground; took four days to do it; burned off the branches also, and, if for a canoe or house-post, the length of log required. If for a canoe, they cut a hole in the surface of the log, kindled a small fire, and burned down and along, carefully drop, drop, dropping water all around, to confine the fire to a given spot, and in this way they hollowed out their logs for the largest canoes."

In writing of the natives of Bowditch Island, the above writer says: "They sometimes burned the trunk of a tree to make it fall . . . but usually cut away at the trunk with their shell hatchets, day after day, until it fell. It took ten, fifteen, and thirty days to fell a tree. Another plan was to dig down and cut the roots."

On page 130 of *Bulletin No. 4* of the Dominion Museum was explained a very singular contrivance used in tree-felling by tribes of the Bay of Plenty district. A corroboration of that information has since been received from Numia Kereru, of Ruatoki, who states that a certain form of stone tool was hafted in an axial manner for use in that method, which he had heard discussed by old men in his youth. (See fig. 16, p. 49.)

Another and more primitive contrivance was formerly employed by Ngati-Porou. We are informed by Tuta Nihoniho that among the Ngati-Porou Tribe the following apparatus was used in the task of felling large trees: A big, heavy stone adze was lashed to a stout shaft in line with it, like a gigantic chisel, similar to the one used in the Tuhoe method; it was also used in the same battering-ram manner, but the gearing and manipulation thereof differed from the Tuhoe method. The shaft, with its attached stone head, was suspended by a long rope from one of the branches of the tree far above. In some cases an *aka* (stem of climbing-plant) would be found growing

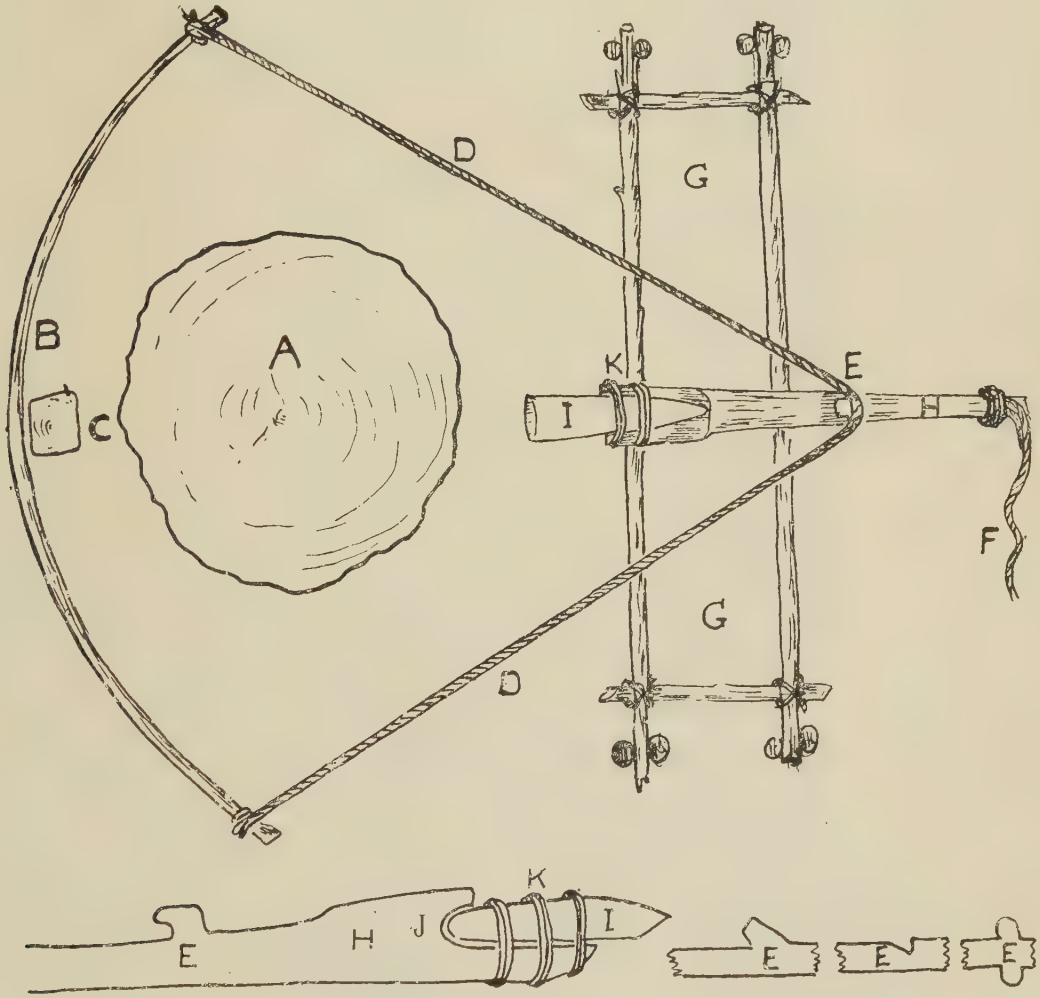


Fig. 16.—The Balista Device employed in Tree-felling.

on the tree in a suitable position, in which case it would be severed and utilized in place of a rope. Near the bottom of the rope (or *aka*) two pieces of rope would be secured by one end, the other ends being fastened to the handle of the tool at a considerable distance apart (see fig. 17, p. 50). Several men manipulated the heavy shaft and swung it back and forth, the stone implement being bashed against the trunk at each forward stroke. Another piece of rope was fastened to the rear end of the shaft, which rope was grasped by several men, who pulled the shaft backwards and then released it.

or let it run loosely through their hands, so that the heavy shaft swung with its stone point against the trunk, thus acting like a pendulum weight.

When a groove or channel (*pakati*) had been so cut or bruised in the trunk the shaft would be raised somewhat and another groove formed parallel to the first. Then

[*Sketch by A. H. Messenger.*

FIG. 17.—AN EAST COAST TREE-FELLING DEVICE.

As described by Tuta Nihoniho, of the Ngati-Porou Tribe.

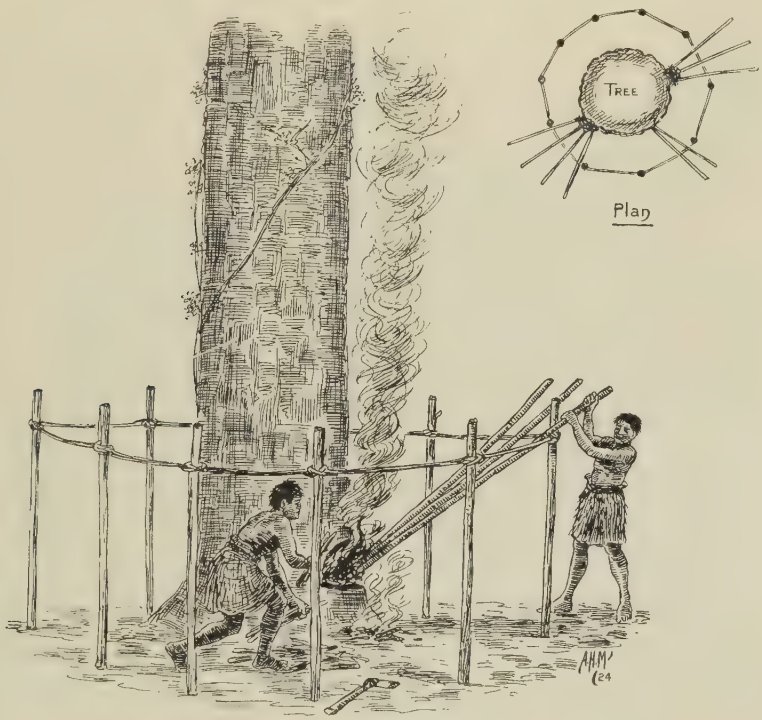
the block of wood between the cuts would be chipped out by using stone adzes sideways. After this fire might be employed.

The word *pakati* seems to be used to denote "a notch," or "to notch." In tree-felling with steel axes it seems to be applied to the bottom cut of the scarf, while the upper and sloping cut is the *whakaheke*.

The following charm was repeated during the work of tree-felling, according to the above authority :—

Haruru te toki, ngahoa te toki, haramai te toki
Ngau atu te toki ki te uma o te rakau
Tenei te toki ka haruru, tenei te toki ka ngatoro
Ko toki na wai ? Ko toki na Whiro te tipua
Oi whiti ka ao.

Apparently trees were not invariably felled in the *umu potaka* or *more potaka* way—that is, by carrying the scarf or kerf right round the trunk—but also by forming a front and back scarf, as in our method, the former being the *imu tua* and the latter the *imu whakahinga*. The terms *imu*, *umu*, *uma*, *tuaumu*, *tuaimu*, and *tarawaha* are all applied to the scarf or kerf in tree-felling. In some cases the fellers stood on a stage to conduct their operations. They would, as they laboured, expectorate into the cut or



[*Sketch by A. H. Messenger.*

FIG. 18.—FIRE-RACK EMPLOYED BY TREE-FELLERS.

As explained by Tuta Nihoniho, of the Ngati-Porou Tribe.

kerf, in order to prevent their arms becoming weary. Charms were repeated over the stone tools in order that they might cut well. Chips were left at the base of the tree. If taken away or burned, some ill fortune would follow—the task would never be finished.

Tuta Nihoniho tells us that the scarf in tree-felling is termed *uma* in the Waiapu district, and was often carried right round the tree by men who used stone adzes sideways—that is, in a horizontal position. When carried in a little distance, a fire was then kindled in it to continue the process. Any part of the tree trunk that it was not desired should be burned was covered by plastering wet clay over it. A curious apparatus was constructed in order to confine the fire within the *uma*—that is, against that part of the trunk it was desired to burn. A number of tall posts were set up

in the form of a circle round the tree and a little distance out from the base thereof. A stout *aka* (stem of climbing-plant) was then bound to these posts in a horizontal position, and at a height considerably superior to that of the *uma*. Then long, stout green poles –saplings—were placed in a slanting position with their lower ends on the bottom cut of the *uma* and leaning against the *aka* ring rails. Fires were now kindled in the scarf, or *uma*, at several places round the trunk, and wood piled on them, such heap of fuel being contrived so as to extend for some distance up the sloping poles. This apparatus, it will be seen, is funnel-shaped, and its object is to confine the fuel to the *uma* where it is desired to burn the tree, for until the fire and adze had eaten far into a big tree there was no support for the quantity of fuel that it was necessary

[*Dominion Museum photo.*

Fig. 19.—Stump of Tree felled with Stone Tools.

Dredged from bed of Ohinemuri River in 1917.

to use. As the bottom parts of the green poles were destroyed by the fire, such poles were slid down the *aka* and their bases pushed into the kerf. As the fuel burned away, that piled higher up the supporting poles slid down into the *uma* and against the tree-trunk. When a pole became too short, another one was inserted. This fire was kept burning for perhaps three days, then extinguished or allowed to die out, and then the stone adzes again came into use to chip off the charred wood and bruise the uncharred surface beyond, to loosen the fibres thereof (a condition expressed by the term *hungahunga*) so that it would be more readily destroyed by fire. Then the fire was again kindled in the cut. See fig. 18, p. 51.)

By this process it will be seen that the scarf or cut extended right round the tree. Thus, in the case of trees that stood upright and were balanced as regards limbs, there was an element of doubt as to what direction they would fall in. In such cases, when the directing experts saw that the tree was sufficiently weakened, they stopped the work, and the workmen retired. Then at night the *tohunga* (shaman, adept) would, by means of a certain rite, call upon the wind to rise and cause the tree to fall in the desired direction. Should such a tree so fall, the fact is accepted as a good omen —the canoe made from that tree will be a lucky one; but if the tree falls in a wrong direction, then an unlucky canoe results—it will probably be capsized at sea.

The bushman says, "You can fell a tree three ways, but if you peg-top her, like a new-chum 'Scandy,' then she is liable to fall fourteen ways."

The following is a maxim of tree-fellers: *Te totara wahi rua, he aitua; kia kotahi, he waimarie* (The *totara* tree that splits in its fall is a harbinger of ill luck; that which remains whole betokens good luck).

Fig. 20.—Man of the Steel Age felling a Kauri-pine.

The evidence shows that the common method of felling was to form by a punching process two parallel and horizontal grooves, then to remove the timber between the two grooves by either using a stone adze sideways, or by splitting it out with a heavy stone tool lashed to a long, heavy handle, and used as a huge chisel. These stone tools were very poor implements wherewith to cut across the grain of timber. In most cases fire was used to assist the process.

The Hollowing-out Process.

The process of hollowing out a log for a canoe-hull is described by the word *waimanu*. The dubbing-down of the exterior is the *tarai* process. The stone adze employed is a *toki;* when used for this purpose, a *toki tarai waka*, or canoe-hewing

adze. These were of different sizes and forms: some were big, heavy, thick tools for rough dubbing work; others were lighter and thinner in the blade, for scoring and secondary adzing; while yet others were still lighter and thinner in the blade, being used for light finishing-work, the final dressing of surfaces. For this latter task an adze of greenstone (nephrite) was highly valued. This stone being of a tough nature, it did not readily break or chip; it is also extremely hard, and the blade of such an adze can be made much thinner, to carry a lower angle, than one made of any other stone.

The labour of severing the head of the tree, when felled, would occupy some days, possibly four or five, or even more in the case of a big trunk. It was effected by means of fire and stone adzes. When the fire had charred the wood to the depth of 1 in., perhaps less, the fire was removed and the charred surface chipped off with adzes, and this process was continued until the trunk was severed.

The canoe-makers had now a huge log, 50 ft. to 70 ft., possibly even more, in length, and 5 ft. to 7 ft. or 8 ft. in thickness, to handle—no light task with their very

[*H. Hamilton, photo.*

Fig. 21.—A Maori Stone Adze.

primitive appliances. If, on account of a shake or other defect, it became necessary to roll the massive log over ere the hollowing-out could be commenced, the task was one that called for ingenuity and the co-operation of many men, for implements were of the simplest nature, and timber-jacks yet in the lap of time.

Log-rolling.—Mr. White has a note to the effect that "logs were turned by means of long sticks curiously fastened by flax ropes." This does not seem to be very clear, but may refer to the *takawhiti* method, or to that known as *poipoi*. The latter consisted of converting the log into a form of Spanish windlass. A hole was made at each end of the log, and in these holes were inserted the ends of stout saplings, to the outer or upper ends of which ropes were fastened. A number of men hauling on these ropes gained great leverage by this appliance in turning a log over. A doubt exists as to whether or not it was a pre-European usage; it is by no means certain that the Maori possessed tools by means of which he could form such holes in a log, the working-face being so small. My informant, Tutakangahau, of the Tuhoe Tribe, was not sure that the method was an old native one. (See fig. 22, p. 55.)

In the *takawhiti* method of turning a heavy log a pole was lashed to the log, near the ground, on the off side—that is, on the side from which the log was to be rolled; two ropes were fastened to this pole, led up and over the log, and trailed forward on

[*Sketch by A. H. Messenger.*

FIG. 22.—THE POIPOI LOG-TURNING DEVICE.

As explained by Tutakangahau, of the Tuhoe Tribe. (See p. 54.)

the hauling-track, to be grasped by the haulers. To fix the pole in position, two cross-pieces were placed across the ends of the log, one end of each being lashed to the pole, and to the other ends was secured a rope. One end of this rope was tied to the end of one

[*Sketch by A. H. Messenger*

FIG. 23.—THE TAKAWHITI LOG-TURNING DEVICE.

of the cross-pieces, the rope was then led along the log, pulled taut, and made fast to the other cross-piece, thus gripping the pole tightly to the side of the log. By placing the pole below the greatest diameter of the log it follows that it could not slip

upwards when the strain came on it. The log would be rolled on skids, and when, in turning it, the pole rose too high it was shifted lower down. (See fig. 23, p. 55.)

This method was employed on the east coast, and probably elsewhere also. It is a form of parbuckling, and is quite feasible; but the rolling of the log would necessitate the lowering of the long spar or ricker several times ere the log was turned completely over, the gain being secured, of course, by a series of chocks. In some cases the long, pliant, and strong supplejack, or *pirita* (*Rhipogonum scandens*), was employed as a rope. The ends of these canes were pounded and bruised to facilitate splicing.

The Maori well understood the use of wooden levers and hand-spikes, termed *hua* and *tuauau*, and made much use of them in log-work.

A form of parbuckling, called *taki-a-manu*, or *takitaki-a-manu*, was described by the late Tuta Nihoniho, of the east coast. The following notes were supplied by him: The parbuckle, or *takitaki-a-manu*, was used in conjunction with levers, and when a long, stout

[*Sketch by A. H. Messenger.*

FIG. 24.—THE TAKI-A-MANU LOG-ROLLING DEVICE.

As explained by Tuta Nihoniho, of the Waiapu district.

rope was employed, so that a large number of men could "tail on" as haulers, it would undoubtedly be of great assistance in the work. The double-rope parbuckle does not appear to have been used by the Maori. If used without the help of levers, then the single-rope parbuckle would not be so effective as the double one, unless, indeed, two single ones were rigged, one at each end of the log — which was sometimes done, according to our informants. (See fig. 24.)

In rigging his parbuckle the Maori fastened one end of the rope to a stout root, or the butt of a tree, some little distance in front of the log to be turned over—rolled. This rope was then passed underneath the log, right over it, and again underneath it, then again up and over, and trailed out along the ground at right angles to the log. A large number of men then took their stations by the side of the rope, grasped it, and hauled away, their strenuous efforts being rendered simultaneous by means of a time-giving song chanted by a fugleman. I am not satisfied that the above was a pre-European apparatus.

The term *tuauau* seems, on the east coast, to be applied to both levers and handspikes, though used in different ways. Again, the expression *takitaki-a-manu* appears to be also applied to anything in the form of a retaining-wall, such as slabs placed behind a series of posts in order to prevent earth slipping down.

The levers used in the turning of heavy logs were manipulated as with us, one end being thrust under the log, and a heavy block provided as a fulcrum. These levers were long, stout rickers, and would be manned by as many men as could conveniently grasp them. In the case of a long, heavy log there would be a number of such levers employed. This log-turning was often an exceedingly heavy task, and in some cases a great number of men must have been employed at it. The task of turning over a tree-trunk perhaps 5 ft. or 6 ft. in diameter at the butt end, or even more, and 60 ft. or 70 ft. perhaps in length, is a colossal task when performed with primitive appliances, as we know full well. It is a very different proposition when you are provided with timber-jacks or a Dolbeer logging-donkey.

The hollowing-out of a dugout canoe-hull was a long and laborious process. To hollow out a canoe as the log lies on the ground, a row of small fires was kindled along the trunk as far as the *riu* (hold) was to extend. After burning for some time these fires were removed, and the charred wood was chipped away with stone adzes. Then fires were again kindled and the process repeated. R. C. Barstow, in his paper on the Maori canoe, says: "Fire and adze partially hollowed out the hold, dry *rewarewa* (*Knightia excelsa*) wood being used for the charring [*kaiwhiria* wood was also used], the amount of excavating done at this stage depending upon the distance to which the canoe has to be hauled and the danger of its splitting on its journey." As an old native once explained this process to the writer, "the adze employed was a stone one; the other adze used was fire." The stone adzes could not be used to the best advantage at such work. It must ever be remembered that these tools were not well adapted for cutting across the grain of timber. A surface to be adzed was first scored across the grain, and the timber-surface then hewn off sideways, with the cutting-edge of the tool in line with the timber-grain, as we often see a steel adze used. Thus the adzing was really a form of splitting: chips were split off the balk or plank. The first process of rough dubbing was done with a big heavy adze carrying a high blade-angle, and known as *tiwara* or *wahanui*, the word *toki* often being prefixed, as *toki tiwara*. Lighter adzing—taking off small chips—may be described by the term *hemihemi;* this applies to the finishing-off (*whakanakonako*) of an adzed surface. These expressions are not universally employed: such terms differ in different districts. (See *Museum Bulletin No. 4*, p. 135.)

A roughly adzed surface may be described as *tarai putaratara*, or *tarai matapo*. The adzes (*toki*) employed in fashioning canoes were of different sizes, form, and material, as explained in *Dominion Museum Bulletin No. 4*.

The first rough adzing of a surface, as in hollowing out a canoe-hull, left the timber-face in a rough condition—hacked, bruised, and jagged with slivers. It was now that fire came into use, and fires were kindled and kept burning along the trunk in order to burn out the bruised, splintered, and worked surface of the timber. This double process was repeated until the experts announced that the roughing-out process was carried far enough; that the interior lines of the canoe were being approached; that the use of fire must cease, and the remaining timber be hewn off by experts with stone tools, until the unmarked and eye-defined lines of the interior of the hull were reached. This final stage of the work had to be slowly and carefully done, in order to leave all the interior curves perfectly symmetrical. Hence such work was very frequently examined by keen-eyed experts, who noted any slight protuberance of timber that needed attention.

There was always one expert, if not more, to watch the work, to check any worker in danger of hewing too deep, and generally to supervise the work. Such a man might, with a piece of charcoal, mark any place where a thin piece had to be adzed off, but

very often such slight hewing was done entirely by eye. In some cases a stick might be used in measuring, as when regulating the width of the hold.

The stern of a canoe being somewhat wider than the bow end, it was usual to make the butt end of the tree the stern. The log might have to be turned over prior to beginning work on the hull, in order to take advantage of some peculiarity in its shape. The form of the canoe was not marked on the upper surface of the log prior to commencing the roughing-out; the Maori artisan ever trusted much more to the practised eye than we do, and did but little in the way of measuring.

The hewing of a canoe-hull was not completed in the forest; it was hauled out to the coast, or banks of a river or lake, while still rough and unfinished, before it was reduced to its proper lines, so that the thickness of the wood might prevent the hull

[*Partington, photo.*

FIG. 25.—A CANOE IN THE MAKING.

Steel-tool work.

splitting in case of any mischance in hauling. It sometimes happened that when lowering a hull down a steep sideling the ropes carried away, and the hull would fall, slide, or roll to the bottom of the hill; some have been so ruined by breakage or splitting, and much labour wasted. Having hauled the thick-sided, rough-hewn hull to a place near where it was eventually to be launched, the adzing-down and finishing-off of the hull was proceeded with, after which came the job of fitting it up. For this task a shed, composed of a roof only, was often erected over the canoe while it was being finished off. The tools used were not taken away from the place while the work lasted, and in some cases, as when an important high-class canoe was being made, the workman had special garments for wear when working. When quitting work these garments were left with the tools in a hut at the work-yard, and the workman retired from the *tapu* place to don his ordinary garments elsewhere ere returning to his home.

Men were allowed to be spectators of canoe-making operations, but not so women. For if a woman passes over the place where the canoe is being made, *ka oma nga atua*, the gods will desert the place, for the passing of the female organ over the ground has desecrated the *tapu* of the spot; it is a pollution resented by the gods, who will desert the canoe and have nothing more to do with it. Hence, when that canoe is finished and taken out upon the ocean the gods will not protect it from danger, and it will probably capsize, or some other serious mishap will occur. This must be so, because it has no protecting *atua*. When the canoe goes out to sea it will be attacked by Tawhiri-matea (personified form of gales), whose enmity towards Tane (personified form of trees—hence a canoe represents Tane) has never ceased, whereupon Tane (*i.e.*, the canoe) will suffer, or perish, on account of being defenceless; it has no gods protecting it.

A northern native states that when the labour of hewing was brought to a close for the day the chips were covered up, lest women trespass on them, which would be woefully unlucky.

When a workman was about to commence to give the surface a final dressing (the *whakarau* process) he would throw a small stone into the hold, to preserve his knowledge of the art of canoe-hewing (*tarai waka*).

Mr. T. Roach, of Otaki, has stated that he knew a blind native who used to work at fashioning canoes with an adze. He kept to the true lines entirely by touch; he would hew away with his adze for a while, then stop and run his hand over the hewn surface in order to detect any irregularity of the surface.

Of the burning-out process "W. B.," of Te Kuiti, has written as follows: "The bole now lies prone, cut to length, and the side for the *riu* (hold) turned uppermost. Then a fire is built along its centre, lengthwise, and slaves stand ready with water-gourds, and watch where it over-croaches to quench it. The fire dies: the charred wood is chipped off, and so the body is rough-hollowed. Then the master mechanics approach to shape and trim, leaving proper projections to be bored for the *rauawa* (gunnel-strake) lashings, and the inside is finished. The shell is now turned over and the outside rough-hewn to approximate form, and four posts, two at each end and side, equidistant from the central or keel line, are firmly fixed in the ground. From post to post, at each side, a fine strong cord is stretched, from which all final measurements are set off, which, assisted by the expert eye of the master, ensures that both sides be exactly alike in outline of curve. . . During these labours no food must be brought near the work, no chips hewn therefrom burnt at the mess-fire; all is done in fear of the gods, of something omitted, ensuring later mischance. Every section of work began with its appropriate propitiatory invocations, as by ancient ritual established, and all thoughts are intent upon future success. For, from the day in midwinter when the sap is low and the tree is felled, two—nay, three years may subtend until the master says '*Toia te waka kia manu*' ('Launch the canoe that it may float'). At which operation a slave is sacrificed, and his blood sprinkled upon her side in the *taingakawa* (sanctifying) ceremony; the name is allotted, and the labour is done."

The above account of the hollowing-out task is, of course, a much condensed one; it was a very long and tedious job. In the later stages of such work fire could not be employed, the stone adze alone being used. The remarks concerning the use of taut lining-cords, stretched parallel to the keel-line, from which offset measurements were made to align the work, are of much interest, and illustrate the ingenuity of the Maori artisan.

It must be distinctly understood that the Maori had infinitely more faith in his old-time gods than we have in ours. If a fortified village, or house, or canoe lose its protecting genii or gods, then it must be abandoned, or disaster will come upon the inmates. Without the protection of the gods it is impossible to prosper—nay, it is often impossible to live.

We have seen that men only were allowed to approach a canoe when under construction. But it is not the case that *all* men were so permitted to go to the shipyard. Any man known to be of an irresponsible nature, or stupid, was debarred from such a privilege, lest he take some article of food to the place, which act would pollute the *tapu* and cause the gods to desert the place and the canoe. For the same reason all dogs were kept tied up during the task of canoe-making, lest they defile the *tapu* in a like manner.

Mr. Lambert informs us that he saw an old native finishing off a new canoe with a stone adze about the year 1866. This was up the Whanga-ehu River. The native had put a certain amount of water into the canoe, which he then tilted at different angles, and he then seemed to be able to more easily detect any superfluous thickness or protuberant parts in the sides of the interior of the vessel, which parts he re-dressed with his stone implement.

Tuta Nihoniho contributes the following note on the above subject: When a canoe was being made, women and children were not allowed to approach the scene of operations — it was *tapu* to them. In some cases a rude fence or barrier was erected round the canoe. No food could be taken to the workmen at the place where the tree was being felled, the hull being hewn out, or the canoe being fitted up. The workmen proceeded to the encampment or village for their meals, or such were brought by the women to some place removed from the *tapu* work-yard. The hulls of canoes are rounded to a considerable extent, and no prominent keel is observed in the central parts, but only near the bow and stern. It is the rounded bulge in the sides of the canoe that supports it, and keeps it from sinking too deeply. If the sides were hewed straighter the craft would be unsteady: the bulge imparts steadiness.

About the final act in finishing off the hull of a canoe was a holystoning process. A number of men worked at rubbing the surfaces with pieces of sandstone.

Mr. John Mackie has related an account of a partially made canoe found by him many years ago near the banks of the Mangawhero tributary of the Wai-ngongoro River. This hull had been almost finished when it was abandoned, and some small trees 6 in. to 9 in. in diameter were growing in it; the hull was *totara*, and by no means badly decayed. This hull had been made in two pieces of unequal length, and the workmen had commenced to fit the two pieces together — that is, to make the *haumi* join. The interior of this hull seemed to show traces of fire having been employed in the hollowing-out process. The hull was about 40 ft. in length and 3 ft. beam.

When the hull of a vessel was being finished off it would be launched in order to see how it rode. By noting any list in the craft, adepts were enabled to decide as to which part must be further hewed down.

Mr. Barstow states that the operation of redubbing and hollowing-out of the hull "is repeated as the timber seasons after the canoe has been in use." This remark might apply to inferior, small forms, but a first-class canoe would be pretty well seasoned and dried out by the time it was finished.

Mr. C. Hedley, in his *Ethnology of Funafuti*, writes: "A glance at a stone adze in the exhibition-case of a museum might not impress a spectator with a high opinion of its utility, but on the first occasion on which I saw a stone adze used my previous ideas on this subject were promptly dissipated. Passing a canoe-builder at work in Kerepunu, British New Guinea, I observed him hewing with a steel tomahawk, while beside him lay a rotary stone adze. Being requested to show how the latter was employed, the native obligingly laid aside his European tool and resumed the Papuan one. Three years' daily toil in the Queensland bush with an American axe had made me familiar with its use, and it was with the critical eye of a fellow-craftsman that I watched the Papuan axeman. I expected to see him chop with short, light strokes; but with astonishment I saw him plant his feet firmly, swing his adze over his left shoulder at full arm's length, sliding the left hand down the handle in doing so, and then,

rising slightly on his toes, bring it down with all the force of every muscle in his arms, back, and legs. After freeing the chip, the adze went up and round and down, and down again, in the most workmanlike style. Under these blows a rain of chips — long broad chips — sprang from the adze-blade over the heads of the bystanders. The aim proved equal to the force, as a strip of timber disappeared inch by inch under well-directed, even strokes."

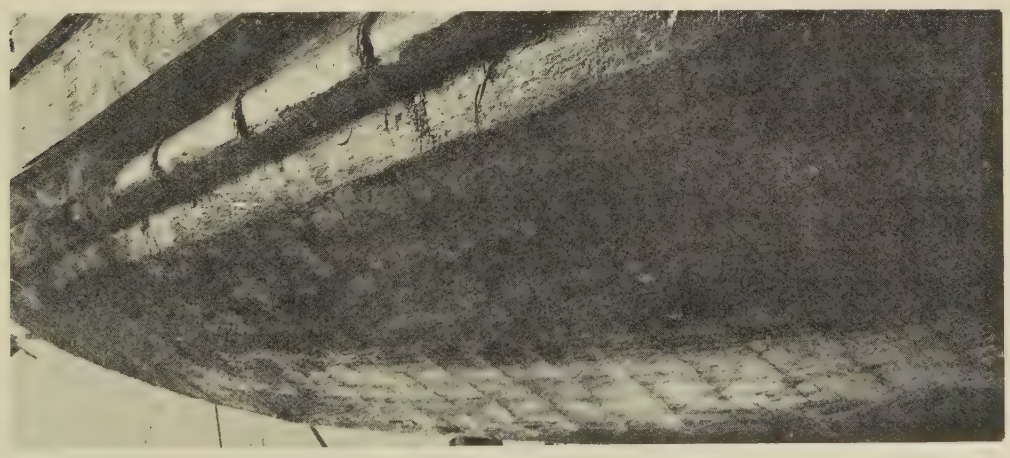
There is no evidence to show that the Maori ever employed the rotatory adze, as some term it, of Melanesia. The Micronesian form of that tool was used by a few western Polynesians, as in the Ellice Group; apparently it was introduced through the Gilbert Group (see Hedley's *Ethnology of Funafuti*). There were three different forms of this interesting implement, and, like the pump-drill, it was evidently creeping eastward when Europeans entered Polynesia. Some thin stone blades from the Solomons and New Guinea, employed in this manner, show an axe-like blade with bevels on both sides fairly equal; but if the pronounced adze form, such as we see in New Zealand and many other isles, were so manipulated — the blade so turned as to bring the cutting-edge in line with the handle — the tool would not be a true axe, but would resemble a squaring-axe, such as we use in hewing balks of timber. This is obvious. Heavy stone tools showing two equal bevels, with the cutting-edge in the axial centre of the implement, are found in New Zealand, but the common Maori implement was the adze.

A remark in the *Catalogue of the Bishop Museum of Honolulu*, 1892, concerning a form of stone adzes, runs: "In a form much used for the interior work of a canoe the stone is so mounted as to turn to one side or the other, thus becoming, as needed, a right- or left-hand adze." After nearly a half century's experience with timber-working tools the present writer is unable to understand the expression "right- or left-hand adze." One might as well speak of a right- or left-hand knife. An adze is not a squaring-axe. It may be that the Hawaiian tool could be used as a right- or left-hand hewing or squaring axe. Our carpenter's axe and squaring-axe can be hafted for right- or left-hand use, but if you so haft an adze as to bring the cutting-edge in line with the handle, then it is no longer an adze.

The following communication is of some interest; it deals with the adzing of the exterior of the dugout hull:—

Native Department, Wellington, 12th January, 1911.

GREETING! When a boy I took a particular interest in canoe-building operations, *tarai waka* (canoe-hewing). Being already aware of the *pakeha* [European] penchant for leaving his woodwork smoothly planed, I was struck by the fact that the Maori deliberately left the outsides of his canoe widely grooved with narrow intervening ridges, thus:



[*H. Hamilton, photo.*

FIG. 26.—HULL OF CANOE.

Showing the *ngao-tu* style of hewing

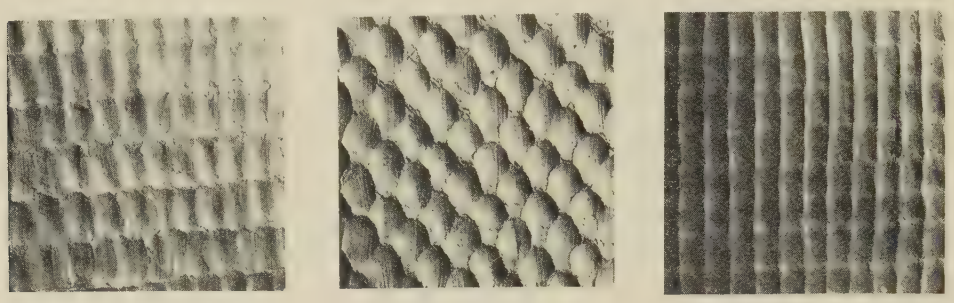
I therefore asked one of our old *tohunga tarai waka* [canoe-hewing experts] what the object was in doing so. He explained to me that the *toki umarua* (double-shouldered adze) was specially made to *pare-ngarungaru* the exterior of the canoe—*kei piri te wai ki te waka* (to prevent the water from *clinging* to the canoe, and so impeding its progress). The object, therefore, was to break up the water which the canoe was passing through, and so to give it greater speed, or to make the business of paddling easier.

There may be science in this. Note the polished exterior of the pakeha racing-skiffs. Does not the water cling to the sides and act as a break from end to end?

Kia ora.

HARE HONGI.

P.S.—The *interior* of the canoe was comparatively smooth.



NGAO-PAE. MAMAKU. NGAO-TU.

FIG. 27.—ILLUSTRATING THREE METHODS OF HEWING TIMBER WITH ADZE.

Apparently some experts only finished off the outer surface of a vessel in the above manner, while others hewed it so as to leave a smooth face.

In speaking of dugout crafts of the Burmese, Mr. F. A. Page writes: "It requires skill of the very highest sort to take a tree-trunk, often more than 70 ft. in length, trim it, and fashion it into a thing of beautiful outline, with a proper sheer to it, the bow and stern rising proportionately above the waist." These remarks might well be applied to the work of the Maori *tohunga tarai waka*, or canoe-hewing experts.

CANOE-HAULING.

The hull of our craft having been rough-hewn into form, the next task is to haul it out of the forest to tide-water, river, or lake, where the final adzing of all surfaces will be carried out and the vessel fitted up. In some cases at least the top-strakes were hewn out and placed inside the hull when it was hauled out. This *toto waka*, or canoe-hauling, was a strenuous task, for which many people collected, the hull being dragged by means of rows of men hauling on long ropes attached to the vessel. Heavy house-timbers and stockade-posts were dragged from the forest in the same way. The last such scene witnessed by the writer was when, about the year 1900, a massive ridge-pole, 70 ft. long, was hauled by man-power about three miles from the head of the Pae-koau Stream to Taua-rau, at Ruatoki. This was done in the old manner to the old hauling-chants.

The hauling-road having been cleared ready for action, a number of skids were procured and a party told off to attend to them. Theirs was the task of picking up the skids over which the canoe had been hauled, carrying them forward, and re-laying them in front. Certain charms were repeated over the skids, that were supposed to be very effective and reduce the labour of hauling.

Skids were sometimes carried in canoes, and special ones were sometimes named. Any skids over which a canoe passed with more than ordinary ease would certainly be named, as the Maori believed that the gods were responsible for such easy movement.

The following notes were contributed by an east coast native: Usually in the moving of a canoe six people are employed behind the canoe to pick up the skids over which it has passed, and to carry them to the front, and six more men are employed in laying down in front the skids over which the canoe will have to travel. Four ropes are led out from the bow with which to haul the canoe over the skids, whilst four ropes are led out from the stern with which to check the speed if, when going down a declivity, there is a tendency to go too fast, so that control over the movement might be lost. Then, on each side of the canoe there are a number of men to keep it from swaying from side to side, and so coming to harm.

The number of hauling-ropes usually mentioned is two, but one authority states that two others were in some cases attached to the after part of the hull, in addition to the two made fast near the bow.

Mr. Colenso writes: "With smart songs of encouragement, sung alternately and in full chorus, they eased the heavy labour of their most laborious works — such as dragging the hulls of their large canoes from the forests, often over many miles of the roughest country, without any road, to the sea; also the large *totara* timbers for their chiefs'

[*Sketch by Miss E. Richardson.*

FIG. 28.—HAULING A CANOE.

Poles lashed on to canoe fore and aft to enable men to steady it; three drag-ropes out.

houses; and often whole trunks of trees to form the outer wall of fortification around their town (*pa*)."

In some cases, when hauling a canoe, long poles were secured along the top of the vessel fore and aft, from bow to stern, the ends projecting well out at either end of the vessel. Men stationed at these projecting ends were enabled to give great assistance in keeping the canoe from turning. (See fig. 28.)

Marsden mentions a canoe that was made in the north and hauled over twenty miles to be floated.

When Williams's 60-ton vessel was carried some distance inland at Rarotonga by a hurricane, she was hauled back to the sea "by the united strength of about two thousand people."

The "Jewess," a 60-ton vessel built at Tahiti and owned by some Wellington residents, ran ashore at Pito-one in the early "forties" of last century. She was hauled down and refloated by about two hundred natives.

The following account of canoe-hauling was contributed by Tuta Nihoniho: The hauling-lines made for dragging canoes were stout ropes carefully plaited in the *rauru*

or five-strand method, and about as wide as one's wrist. They were made from dried leaves of *ti torere* (*Cordyline Banksii*) or *ti kauka* (*C. australis*), both strong materials, for they have to bear a very great strain. Three tow-ropes were used in dragging a heavy canoe. (See figs. 28 and 29).

When the canoe was being rough-hewn, a piece of timber was left projecting upwards from the bottom of the interior at the bow end (see the "Heke Rangatira" canoe in the Dominion Museum), and a similar one at the stern end. Holes were bored in these projections through which to pass the hauling-ropes, which were so secured. One such rope was tied to the forward *putiki*, or *maunga taura*, as they were termed, and two to that at the stern. Of the latter, one was led along on either side of the canoe, so that there was one hauling-rope running straight ahead from the bow end and one on either side, each being manned by a number of men.

All such heavy weights were hauled over smooth skids of round pieces of green timber. For this purpose the natives always endeavoured to obtain pieces of *houhou* (*Panax arboreum*). When the bark is knocked off, it is seen that the exposed surface of the wood is remarkably smooth and glairy. This slimy and slippery surface is most

[*Sketch by A. H. Messenger.*

Fig. 29.—Hauling a Canoe.

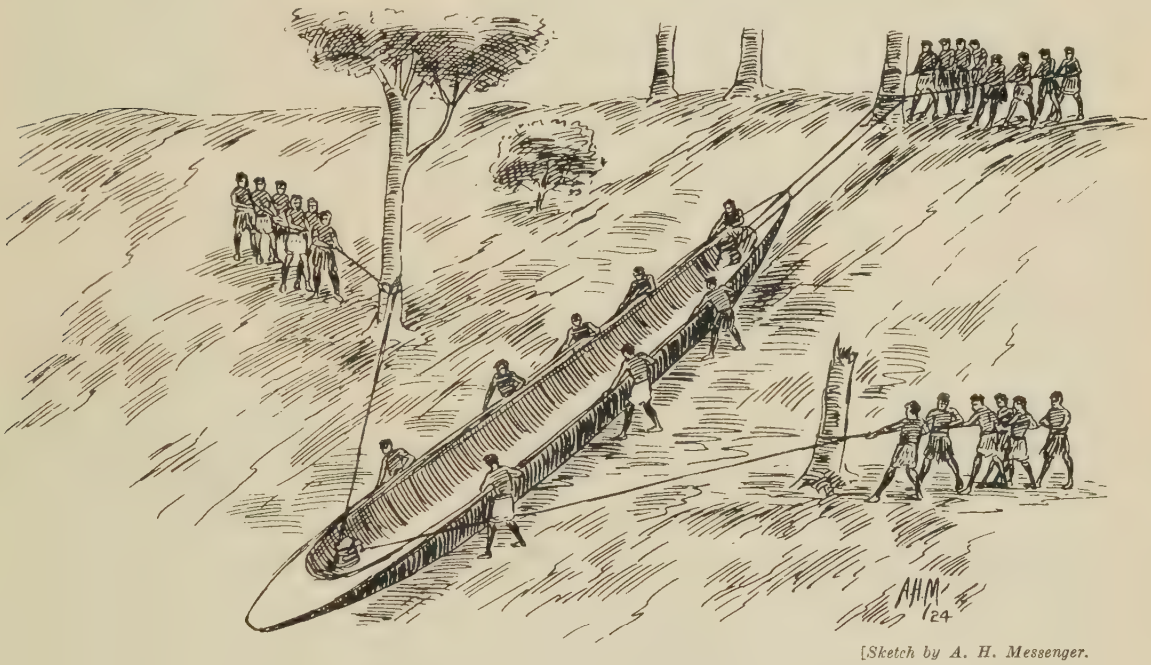
The projections to which the ropes were attached were down inside the hull.

desirable in a skid, inasmuch as it tends much to lessen friction when a heavy body is being dragged over it. Such skids (*ngaro*, *neke*, or *rango*) are usually about 6 in. in thickness, and 5 ft. or 6 ft. long, one end of each skid being sometimes reduced in size in order to provide a good hand-grip for the men who were told off to handle the skids—to keep taking them from behind the canoe and re-laying them in front of it.

When the canoe-hull was about to be lowered down a bluff or steep hillside a change was made in the disposal of the attached ropes. The two ropes fastened to the stern were swung back so as to trail astern, and were brought near together instead of being some distance apart. An extra rope was likewise fastened to the *putiki* at the bow of the canoe: thus there were now two ropes at each end of the hull. The two bow-ropes were also led back, one on either side of the canoe, and each one was passed round a tree-trunk (or post firmly set in the ground) with one turn. The two stern-ropes were led straight out astern of the hull, and a turn of each was taken round the same tree. With these four ropes and plenty of man-power control was kept over the canoe. The rope-tenders took station, the canoe was started down the declivity, the four ropes being

slowly and carefully payed out as she glided downhill, the whole operation being under the direction of an adept, such as a Californian lumberman would term a "head chain-tender."

When the two bow-ropes were run out to their full length, word was passed to the tenders of the rear ropes to belay. They at once took an extra turn of their ropes round the snubbing-tree, and held on. The tenders of the bow-ropes then cast off, trailed ahead, and, selecting two fresh snubbing-trees, ran their lines round them ready for a new start. When the stern-lines ran out, new snubbing-posts were utilized in a similar manner, the bow-lines holding the canoe meanwhile. Naturally, no skids were used in a downhill haul unless the slope was an extremely easy one. In open country posts were set in the ground for the snubbing-lines, which were passed round the bases of them. Ropes were fastened to the tops of such posts, and held by a few men to render them more stable. On a hillside covered with fern, and especially if the soil was of a



[*Sketch by A. H. Messenger.*

FIG. 30.—METHOD OF LOWERING A CANOE DOWN A STEEP HILL.

loose nature, a canoe would have to be hauled down quite steep slopes, on account of the great amount of friction. (See fig. 30.)

When engaged in a heavy haul, as on level ground or an up grade, the hauling was timed to certain songs, termed *rangi waka*, or *to waka*—one of the different classes of *tewha*, or work-songs, employed by the Maori. They consist of short chanted phrases sung by the *kaea*, or fugleman, and a chorus, usually short, given by the haulers. The *kaea* sometimes runs back and forth as he performs his task, and sometimes stands in the canoe as it is hauled along. His phrases are yelled out at the top of his voice; and should his vocal chords give out he is relieved by another person. The chorus is also rendered in an energetic manner by the haulers, who at that time are most strenuous in their work and haul with fierce energy. When such labour is properly conducted it is an inspiriting sight. Resting-intervals occur with greater or less frequency, according to the heaviness of the task.

The following is a specimen of the above songs :—

The *kaea* cries ..	Toia te waka !
Chorus by haulers	E !
Kaea	Toia te waka !
Chorus	E !
K.	E, toia te waka ki—
C.	Runga ki te maunga e tu mai nei
	Ka whakatakotoria ki runga ki te rango parapara koa
	Me he tete waka
	A, me he tete waka
	Me he pitau whakareia
	E !
K.	Kumea mai . . .
C.	Te waka
K.	Ki te urunga
C.	Te waka
K.	Ki te moenga
C.	Te waka
K.	Ki te takotoranga
C.	I takoto ai te waka . . . E !

Here another *kaea*, or fugleman, takes up the signal cry :

Kaea	Karearea
Chorus	Hi !
K.	Karearea
C.	Hi !
K.	Hopu ki waenga
C.	Hi !
K.	Po ka po
C.	Haramai nei hei awhi, hei ai.

(And so on : above eight lines repeated.)

When the hull was hauled to its destination near a launching-place, where it was to be redubbed, fitted up, and finished, a shed with open sides was erected to contain it. This shed is *tapu*, and only the *tohunga tarai waka*, or canoe-hewing experts, are allowed inside it. As a rule the *putiki* was now chipped out, being no longer needed.

The same correspondent furnished the following :—

A Canoe-hauling Song.

Fugleman ..	Turukiruki, panekeneke i a ihu waka
	Aue ! Turuki ! Turuki !
Chorus by haulers	Paneke ! Paneke !
F.	Turuki ! Turuki !
C.	Paneke ! Paneke !
F.	Paneke i a wai ?
	Paneke i a aitu
	Hui-te-rangi-ora te toki matapo.
C.	Ia !
F.	Matapo !
C.	Ia !
F.	Huri te poi
C.	Marino mai.

Should the canoe get jammed or caught in some difficult place during the process of hauling, then the following chant was started, and the team redoubled its efforts to move the great weight :—

Fugleman ..	Tuturi, pepeke, hokai o waewae
	Ki te rangi nui e tu nei
	E ha ! Mou hikitia !

Chorus by haulers		Mou hapainga !
F.	.. ..	Mou hikitia
C.	.. ..	Mou hapainga
F.	.. ..	Whakakake maunga e tupa
C.	.. ..	Whai ake
F.	.. ..	Whakakake maunga e tupa
C.	.. ..	Whai ake
F.	.. ..	Whakaeke pari e tupa
C.	.. ..	Whai ake
F.	.. ..	E tupa whai ake
C.	.. ..	Hoi . . . E !

In a note published in volume 17 of the *Journal of the Polynesian Society*, at page 167, Hare Hongi remarks: "In addition to the ropemen, a number of haulers were ranged along from end to end of the canoe itself. These men would, when the word was given by their fuglemen, extend one arm forward and one arm aftward, grasping the topsides, with chests pressed against the canoe-sides, simultaneously impel the canoe forward, and march along beside it. The phrase or call of the fugleman, "*E . . . e . . . e, tupa whai ake*," whilst ensuring a unity of effort on the part of the two sets of haulers, exactly pictures the work and attitudes of the haulers:—

Toia mai te waka
E . . e . . . e
Tupa whai ake.

In some cases, it is said, a kind of sheepshank, called a *koromatua*, was formed in a rope and used in lowering a canoe down a hillside, the shank enclosing the projecting stern end of the canoe, it being lowered stern first. The ends of the rope trailed backwards and were held by two lines of men. Such a place where a canoe was lowered down a hill was called an *ara tukutuku waka*, or canoe-lowering way: hence we find such place-names as "Te Ara Tukutuku waka o ——" (the name of some chief occupying the blank space).

The following item was collected by Mr. John White: When a new canoe is about to be hauled from the place where it has been fashioned, the *tohunga* repeats the following charm over the canoe, the stump, and the severed head of the tree. This charm is known as a *wehe*, or *poroaki ki te tumu* (a taking-leave of the stump—it is the farewell of the canoe to its origin). The expert stood on the right-hand side of the canoe as he chanted the ritual, which formed a part of the placation of Tane on account of the destruction of the tree, about to be transferred to the realm of Kiwa (the ocean).

Kotia te pu, waiho i kona
Kotia te kauru, waiho i kona
E ai ra ko te umu tuhi
Kihai i tae ki nga pukenga
Ki nga wananga, ki nga tauira
Matua kuru, matua whao
Matua te toki, matua te tatai haruru
Tu ake au ki runga nei
Ki te whare hukahuka no Tangaroa
Tangaroa i whatiia i ahunuku tai maroro
Orooro te toki na Hine-tu-a-hoanga
Kaore ko au, ko Rata, e kimi ana
E hahau ana i te awa i Pikopiko-i-whiti
Mate iho ana ki Maunga-roa
Mate mai ai Kowhiti-nui.

(Chorus by people) Ta taua rangi!
(Tohunga) .. Mate mai i a Rata Wahie-roa
(Chorus) .. Ta taua rangi
E ri, e ri . . . e
E ra, e ra . . . e
(Tohunga) .. Huka!
(Chorus) .. Huka!
(Tohunga) .. Huka te riri
(Chorus) .. Huka!
(Tohunga) .. Huka te tauarai
(Chorus) .. Ha!

During the repetition of this effusion the men are all standing by the ropes attached to the canoe, and as they shout forth the final word "*Ha!*" they all haul on the ropes and start the canoe from her bed. The hauling is then proceeded with to a time song, termed *to waka*, and intervals are allowed for resting. The hauling is done over a skidway. When the canoe is launched, should there happen to be no water in the hold the *tohunga* dips a bailer into the water and pours some into the canoe. He then steps into the canoe and dips the forefinger of his left hand into that water, and then puts the finger in his mouth. Then, as he waves his hand up and down before him, he recites the charm called a *whakainu*. All items used in war, as weapons, canoes, &c., have a *whakainu* charm repeated over them ere they are first used. Food is then cooked for a ritual feast. That for the *tamatane*, or male element, is eaten by old men, and old women eat that prepared for the female element, the two lots of food having been cooked in separate ovens. The bulk of the people merely look on while this food is being consumed. When the food for men is taken from the oven it is put into a new basket, which is held up by a *tohunga* and waved before him as an offering to Tane, Tangaroa, and Rongo. The food for women is served in a similar manner by a *ruahine*, or priestess. Only a small quantity of *kumara* is cooked for this rite, not sufficient to form a meal for the persons participating in it. This ceremony is said to be for the purpose of conciliating the gods, and so ensuring success in battle. (It was also probably a *whakanoa*.)

Here follows another hauling-chant, such as were employed by canoe-haulers. It also was collected by the late Mr. White, author of the *Ancient History of the Maori*.

Canoe-hauling Chant, or Time Song.

The fugleman or time-giver sings—

Toia Tainui, Te Arawa		
Kia tapotu ki te moana		
Koia i hirihiri te mata whatitiri		
Takatakatu mai i taku rangi tapu		
Ka tangi te kiwi	*Response by haulers*—	Kiwi.
Ka tangi te moho		Moho.
Ka tangi te tieke		Tieke.
He poho anake		To tikoko, tikoko.
Haere i te ara		Tikoko.
Ko te taurua te rangi		Kauaia.
Ko te hao tane		Kauaia.
Homai me kawe		Kauaia.
Me kawe ki whea		Kauaia.
A ki te take		Take no Tu.
E hautoia		Toia.
Hau riri		Toia.
Toia ake te take		Take no Tu.

INTERVAL.

Fugleman—	*Response*—
Koia rimu haere	Kauaia.
Totara haere	Kauaia.
Pukatea haere	Kauaia.
Homai te tu	Kauaia.
Homai te maro	Kauaia.
Kia whitikia	Kauaia.
Taku takapu	Kauaia.
Hihi . . . e	Haha . . . e.
Tipi . . . e	Tata . . . e.
Apitia	Ha.
Ko te here	Ha.
Ko te here	Ha.
Ko te timata	E ko te tikoko pohue.
E ko te aitanga a mata	E ko te aitanga o te hoe manuka.

INTERVAL.

Fugleman—	*Response*—
Ko au, ko au	Hitau . . . e.
Mate ko te hanga	Hitau . . . e.
Turuki, turuki	Paneke, paneke.
Oioi te toki	Kauaia.
Takitakina	I . . . a.
He tikaokao	He taraho.
He parera	Ke-ke-ke ke.
He parera	Ke-ke-ke-ke.

The hauling of canoes across portages was not an uncommon usage in former times, and much labour was sometimes expended in such tasks when considered necessary in order to accomplish a set design, as seen in the Ngapuhi advance on Roto-rua. I cull the following from Mr. Wade's journal of a journey through the Manukau district in the far back "thirties":—

"There is a remarkable facility of water conveyance in this part of the Island. With perfect ease canoes can be dragged over the short distances between one river and another; so that the tribes of the Thames on the east coast can pass over to Manukau on the west, and thence on to Waikato. From Wai-te-mata, in the Thames Gulf, canoes are brought to Manukau over the dragging-place on which we were travelling. Crossing Manukau Harbour, they pass up a river or creek, which brings them within so short a distance of the Awaroa, a branch of the Waikato River, that another easy drag puts them in a position either to go out to sea by Waikato Heads, or to paddle on beyond Manga-pouri, upwards of a hundred miles up the river."

In speaking of the portage at Otahuhu, as seen by him in 1834, Missionary Williams remarks: "We walked over the neck of land to Manukau, which is about three-quarters of a mile in extent—good ground, and the appearance of a cart-road, from the numbers of canoes which have been drawn over it from time to time."

When Ngapuhi attacked Waikato at Matakitaki they hauled their great canoes over the portages of Otahuhu and Waiuku, to find the Awaroa Stream, down which they must pass to the Waikato River, blocked by felled trees, the work of their enemies. "The Waikato tribes," writes Mr. S. Percy Smith, "in anticipation of this event, had felled trees across the stream to stop the fleet, but these were cleared away, and in some places, which are pointed out still, Hongi had to cut short channels across sharp bends in the stream to allow his canoes to pass. The native account says it took Hongi two months to clear away the obstructions."

These northern raiders had a similar task when advancing on Rotorua from the Bay of Plenty in 1823. They took their canoes from Waihi up the Pongakawa Stream.

Writes Mr. Percy Smith: "The stream, although deep, is narrow and tortuous, so that it must have been a great labour to force the Ngapuhi war-canoes up its course. On arrival at the head of the stream, where the subterranean water comes forth (from Roto-ehu), the expedition cleared out the old path leading through the forest to Roto-ehu Lake, and then dragged their canoes along it to the lake iteslf. From Roto-ehu there is a level valley joining the above-mentioned lake to Roto-iti Lake, about a mile and a half in length. Along the path through the beautiful forest there the canoes were again dragged to the shores of Roto-iti at Tapuae-haruru."

In Brees' *Pictorial Illustrations of New Zealand* is a picture showing a number of natives hauling a canoe down what is now Hawkestone Street, Wellington. (See fig. 31.)

Having hauled the rough-hewn hull to tide-water or river-side, wherever the craft was to be launched when completed, the next task was to finish the dubbing. It seems

[*From Brees' "Pictorial Illustrations of New Zealand."* *Re-sketched by Miss E. Richardson.*

FIG. 31.—NATIVES HAULING A CANOE DOWN HAWKESTONE STREET, WELLINGTON, IN THE "FORTIES" OF LAST CENTURY.

probable that at various stages of the process of hewing out the hull it was left alone for considerable periods of time, in order that the timber might season without splitting. One of these stages was after the rough dubbing of the dugout hull had been done, prior to the final adzing-down of the surfaces. This latter process left the hull ready for its fittings to be attached, its dressed surfaces either smooth or showing the vertical and parallel but extremely shallow depressions produced by the slight curve in the cutting-edge of the stone adzes employed. This singular *ngao tu* impression or effect is admired by Maori craftsmen, and, in finishing off the adzing of house-timbers, different designs, each having its special name, were worked on the hewn surfaces.

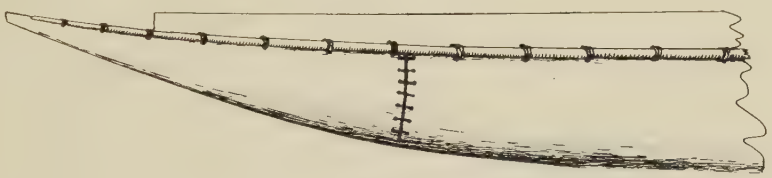
The Waka Haumi.

The term *waka haumi* is applied to a canoe of which the dugout hull is composed of more than one piece. Many large canoes were of one piece, hewn out of a huge log possibly 70 ft. in length, in some cases still longer; in other cases clear-boled trees of sufficient length were not obtainable, hence the *haumi*, or extra piece wherewith to lengthen the hull, would have to be obtained from another tree. Many of the larger canoes had one *haumi*, and some had two. In the latter case one would be fitted at each end of the hull; thus the dugout hull would be composed of three pieces. Polack speaks of having seen at Uawa a canoe named "Te Uru-a-tau" (so called after a deceased chief of renown) that was formed of four pieces tightly put together, was sixty feet in length, and six feet three inches in beam." If this means that the hull was composed of four pieces, a three *haumi* craft, then the makers must have had access to a very poor forest; a 60 ft. hull is not a very long one. It may, however, have been an old vessel, out of which decayed portions had been cut and new pieces fitted in, as was sometimes done.

According to the Ngati-Porou folk, the term *haumi* was, properly speaking, applied only to the piece added to the stern of a canoe; a piece so added to the bow was called *putara*.

The hull of a canoe, as distinct from any top boards, &c., is called the *kaunoti* in the east coast district, but *hiwi* in many other parts of the Island.

A canoe-hull formed out of one log, having no *haumi*, is termed a *kotore-puni*. Should any mishap occur by which one end of such a canoe was broken, then the



[*Sketch by Miss E. Richardson.*

Fig. 32.—The Haumi Tuporo Join of Canoe-hull.

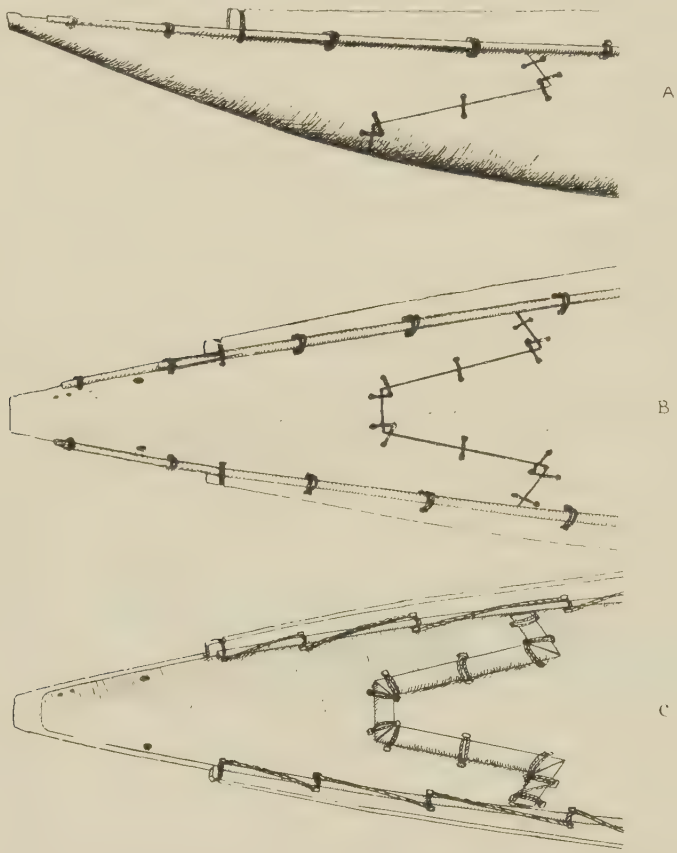
injured part of the vessel was cut off and a *haumi* spliced on. Or if a log was not long enough to furnish a hull of the desired length, then a *haumi* was attached to one end in order to lengthen it. In some cases a *haumi* would be attached at both ends, one at the bow and one at the stern. The bow of a canoe is called the *ihu*; the stern is *kei*, or *noko*, or *paremata*; the keel is termed *takere* and *tangere*.

In an old tradition concerning the coming of certain canoes from Tahiti to New Zealand mention is made of three *haumi* in connection with one canoe, which would mean that such a vessel had two *haumi* at one end and one at the other. If this was so, it must have been on account of the small size of the trees used, which would necessitate the adding of three extra pieces to the hull. One might suppose that this arrangement would much weaken a canoe; but we must bear in mind that the Tahitian canoes had more than one *rauawa*, or top-strake—in fact, they had three. This would mean that such upper planks, continued right along over the *haumi* join, would tend to make the whole hull rigid, and prevent the various parts thereof working loose, so long as the lashings held; and it is known that, in long voyages, stops were occasionally made at islands in order to relash the parts of the patchwork vessels.

In connection with the above tradition of the canoes with three *haumi*, the expression *haumi tuporo* is used, which seems to imply that such extra pieces were square-cut and simply butted against a similarly cut end—not fitted as the *haumi* of New Zealand were. (See fig. 32.)

The above notes on the *haumi* were contributed by the late Tuta Nihoniho, of the Ngati-Porou Tribe. The *haumi tuporo* mentioned represented a square butt join, an

inferior mode of attachment said to have been sometimes employed by the Maori in the case of their smaller canoes. The ordinary method, called *haumi kokomo*, was much superior, consisting as it did of a tongue fitted into a corresponding opening cut out of the opposing section—a huge tenon and mortise, in fact. Tuta furnished the following additional notes on this subject: The *haumi* of a canoe had a large slot or mortise cut in it, into which was fitted the tongue projecting from the end of the *kaunoti*, or hull. The two wings, or projecting pieces of the *haumi*, on either side of the slot, were termed the *paihau* or *kuwha;* the projecting tongue on the hull was the *kuru* or *ure*. The slot was sometimes referred to as the *aroaro*. In order to secure the *haumi* to the hull, recourse was had to the usual method of lashing. Holes were bored right across the end of the hull—that is, along the two sides of the tongue and on either side of the base of the tongue—the outer end of the tongue being the only part not so bored. In like manner



[*Sketch by Miss E. Richardson.*

Fig. 33.—The Haumi Kokomo Join of Canoe-hull.

A. Side view of hull. B. View from beneath. C. View from above.

the corresponding parts of the *haumi* were bored. These holes were bored with the *tuiri*, or stone-pointed drill, and were not diagonal, but pierced right through the end of the hull and that of the *haumi*. The latter was then fitted on and firmly lashed with strong cords of *Phormium* or *Cordyline*, the plait being a *tamatoru*, or three-strand one. Grooves or channels were made in the surface of the canoe so as to countersink the lashings. This was done on both the outer and inner surfaces of the canoe. If not so countersunk the lashings would soon suffer by abrasion, more especially those on the outer side, as when the canoe was being hauled to or from the sea. In some cases, when the join was a long one, battens might be placed over the join on the inside of

the vessel, two at the ends of the two *paihau*, and one on either side of the *kuru* or tongue, but none at the end of the tongue. The holes to pass lashings through are *kowhao matapupuni*. (See fig. 33, p. 72.)

The square-cut style of *haumi*, with no slot, but butted squarely on to the hull, was a much more primitive method of joining, and was often termed *poro harore*. Presumably it was the more ancient form. Popular tradition states that it was Iranui who showed her relative Kahungunu the improved style: the tale is a characteristically Maori one.

Strips of dried butt ends of leaves of *raupo* (*Typha angustifolia*) were placed in joins of the *haumi* to assist in rendering it watertight. The main part of the hull, as distinct from the *haumi*, is termed the *kaunaroa* in some districts.

Williams gives *mimira* as a native word meaning "to fasten on the *haumi* of a canoe." It may be a form of *mimiro*, explained later on.

The *punake* is, according to *Williams's Maori Dictionary*, "the fore end of the body of a canoe, to which the bow-piece (*tauihu*) is fastened." Tuta stated that the name applied to the inside of the hull only, and merely to that part under or immediately behind the *tauihu;* the cable of the bow anchor was stowed at this spot. A freer rendering was the space between the bow and the first thwart.

The side of the hull is sometimes alluded to as the *kaokao*. The *papa-kai-ra* is the outer surface of the side of a canoe; the *papawai* is the outer surface of the lower part of the hull, and the bilge is the *pawai;* while *riu* is the hold.

A canoe from Whanganui (No. 1869), now in the Dominion Museum (see fig. 41, p. 80), has a short *haumi*, only 5 ft. in length. The *kuru*, or tongue, on the body or hull is 17 in. in length, 12 in. wide across its base, and 5½ in. across its distal end. The end of the hull outside the base of the tongue is not cut square, but as shown in fig. 33, C, p. 72.

The *haumi* is, of course, carefully fitted into these recesses. On the inside the joints are covered with battens, which are secured in the same manner as those covering the junction of top-strake and hull. Through holes bored along sides of the join lashings are passed that enclose and grip the batten. These holes are bored right through the hull and *haumi*, or attached piece, but no batten mars the symmetry of the outside, where the lashings are countersunk below the plane of the surface. In the vessel being described, after the lashing was completed the grooves containing the lashing-cord were filled up with putty, a very modern material.

A remark at page 166 of volume 30 of the *Journal of the Polynesian Society* seems to point to a ceremonial performance connected with the dovetailing of the *haumi*. It illustrated the popular story concerning Iranui referred to above.

Barth speaks of an African dugout canoe, 35 ft. long and 26 in. wide in the middle, as being made of "two very large trunks joined together with cordage." One would scarcely suppose that such a vessel called for "two very large trunks" in its construction. Moreover, this vessel was apparently formed of two pieces of about equal size, whereas among the Maori the *haumi* was essentially an end piece used to lengthen a hull. If greater length was needed, the Maori did not obtain it by a middle joining of two large sections, but formed his hull in three sections by putting a *haumi* at both ends. He preferred a solid structure for the middle part.

In fitting up the hull of a canoe, the first item attached was the *haumi*, or *haumis*,* if any; then the *rauawa*, or topsides; then the *taumanu*, or thwarts; then the *tauihu*, or figurehead; then the *taurapa*, or stern-piece—each with its appropriate ornaments; then the *rahoraho*, or flooring.

Our assembled *tohunga whaihanga* (artisans, industrial experts), having secured the *haumi* (plural or otherwise), now proceed to the lashing-on of the top-strakes.

* A vile form! O for the plural article!

The Rauawa, or Top-strake.

Another form of the name of the top-strake is *rauoa*. Mr. R. H. Matthews states that "This plank is called *oa* when free, but *rauoa* when fastened in position." The Rev. R. Taylor has *pahua* as a name for the *rauawa*, but apparently there is no corroboration of this.

The *rauawa* is the plank secured to the top of the sides of the dugout hull in order to increase the height thereof. The join was a butted one, as in a carvel-built boat, and the plank was procured in as long a length as possible. If more than one piece had to be employed on a side, then the join was made towards the end of the vessel, and not in or near the middle. The ends were not lapped in any way, but butted together (*tutaki poro*), and lashed in the usual manner. The hewing-out of a top-strake of, say, 60 ft. in length and perhaps 15 in. in width was no light task with rude stone implements, for it meant reducing the whole tree-trunk to the thickness of a plank. Two or more trees would have to be felled in order to provide top-strakes for our canoe. Tuta Nihoniho stated that in some cases a log was split through the middle, so that two top-

[*Sketch by T. W. Downes.*

Fig. 34.—Canoe fitted with Two Top-strakes.

After Gilfillan. (See p. 75.)

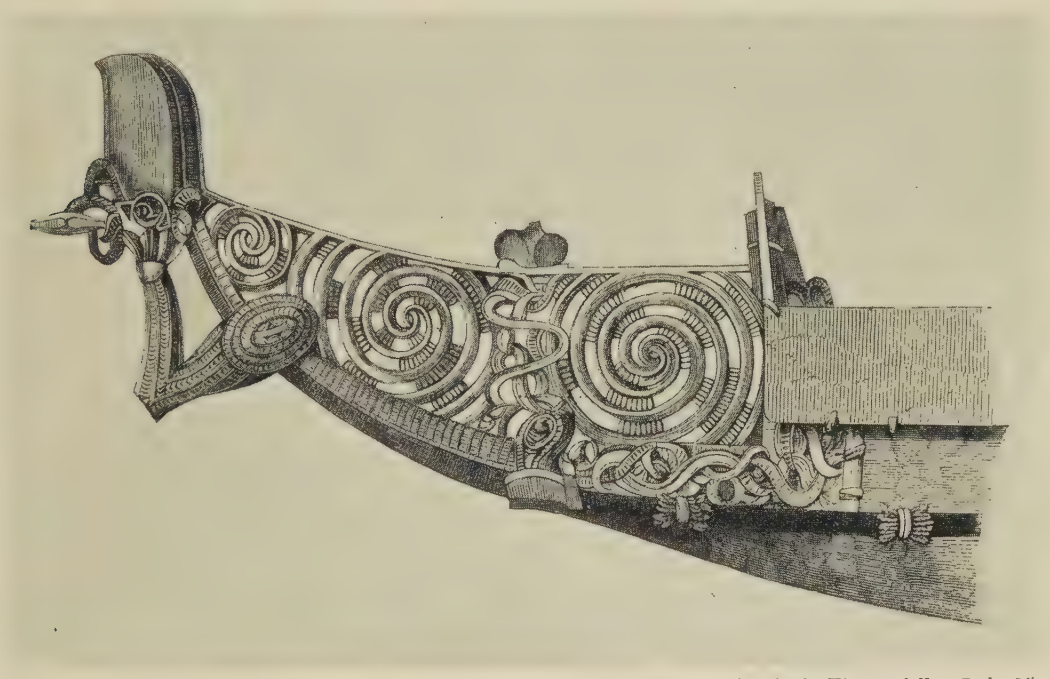
strakes were obtained from one log. This may have been done in late times by using blasting-powder, but after half a century's experience in timber-working the writer is not prepared to believe that the Maori, with rude implements consisting of wooden wedges and a wooden beetle, could split large and long logs of *kauri*, *totara*, or *rimu*. The splitting of a white *tawa* (*Beilschmiedia tawa*) in order to manufacture bird-spear shafts he may easily have accomplished.

As an old timber-worker the writer has long been puzzled as to how the Maori succeeded in splitting logs with wooden wedges—or, rather, to be precise, how he managed to enter the points of his wooden wedges, for that would be a difficult part of the process. The following note, taken from the account of the sojourn of Captain Wallis at Tahiti in 1767, explains an ingenious method of entering such wedges that was probably known to and employed by the Maori of New Zealand: "The tree is first felled with a kind of hatchet or adze, made of a hard greenish stone, fitted very completely into a handle; it is then cut into such lengths as are required for the plank, one end of which is heated until it begins to crack, and then with wedges of hardwood they split it down: some of

these planks are 2 ft. broad, and from 15 ft. to 20 ft. long." The small entering-wedges (*pipi*) would be inserted in such cracks.

In olden times, says a native informant, sea-going canoes are said to have had several side-boards, fastened one above the other. This seems to refer to canoes made in the isles from which the ancestors of the Maori came. But the double side-board was occasionally used here—*i.e.*, two *rauawa*, one above the other. A canoe so fitted is said to have been seen at Nukutaurua about the middle of last century.

The Whanganui natives assert that canoes fitted with two attached strakes were used by them for sea-going purposes up to the time of the arrival of Europeans in their district. This statement serves to explain Gilfillan's sketch of a canoe with two attached strakes. (See fig. 34, p. 74.) These natives call the top-strake *pairi*. In some cases, apparently, a fore wash-strake was fixed by them on the *rauawa*. (See fig. 35.) They used aerial roots of *Freycinetia* (*kiekie*) as lashing-material for these strakes. They employed the implement styled a *tanekaha* to tighten the lashings, also employing the word as a verb, a synonym



[*From Brett's "Early History of New Zealand."*

Fig. 35.—Prow of Canoe showing a Fore Wash-strake above Rauawa.

for *aukaha*. When taut, a wooden toggle was driven into the hole through which the lashing passed, to grip it while it was being reeved through the next holes. The holes were tamped with *pua raupo*, a wooden caulking-implement being used for the purpose. The Whanganui folk employ the term *rikomako* to denote the lashing of the top-strake.

In D'Urville's illustrations of the Maori canoe appear two representations of superior figureheads attached to hulls. In both cases two strakes are shown attached to the hull. Inasmuch, however, as only the fore part of the hulls is depicted, it is possible that the upper attachment was merely a fore wash-strake and not a continued one.

The word *oa* denotes the top-strake of a canoe in Samoan, and it occurs in the Melanesian area. The term appears as *araoa* at Tahiti, apparently, while the form *rauawa* appears to be a variant form of *rauoa*.

In his account of the natives of the island of Tana, New Hebrides Group, Cook describes the local method of securing the top-strake of a canoe as being the same as that

employed by the Maori: "These canoes were of unequal sizes, some thirty feet long, two broad, and three deep, and they are composed of several pieces of wood clumsily sewed together with bandages. The joints are covered on the outside by a thin batten champered off at the edges, over which the bandages pass. They are navigated either by paddles or sails. The sail is latteen, extended to a yard and boom, and hoisted to a short mast. Some of the large canoes have two sails, and all of them outriggers."

In speaking of the *kumara*, or sweet potato, as seen at the Bay of Islands, Wilkes remarks: "The missionaries stated that the natives have a remarkable tradition in relation to this root—namely, that it was first brought to the Island in canoes of a different construction from their own, and composed of pieces of wood sewed together." This may possibly refer to Polynesian canoes, many of which are made of a great number of small planks lashed together. On the other hand, all superior Maori canoes had at least one attached strake.

Of some canoes seen at Queen Charlotte Sound in 1773 Forster writes: "The bottom of these canoes consisted of a long hollow trunk of a tree, and the sides were made of several boards or planks above each other, which were united by means of a number of strings of the New Zealand flax-plant, passed through small holes, and tied very fast. The seams between them are caulked with the downy or woolly substance of the reed mace [*raupo*]." This certainly reads as though canoes with more than one top-strake were seen here; the phrase "above each other" seems to be exact.

The adding of side-boards was practised in Burmah, where war-boats 80 ft. to 100 ft. long, and up to 8 ft. in width, were seen in 1800; it was also employed by the Indians of Guiana.

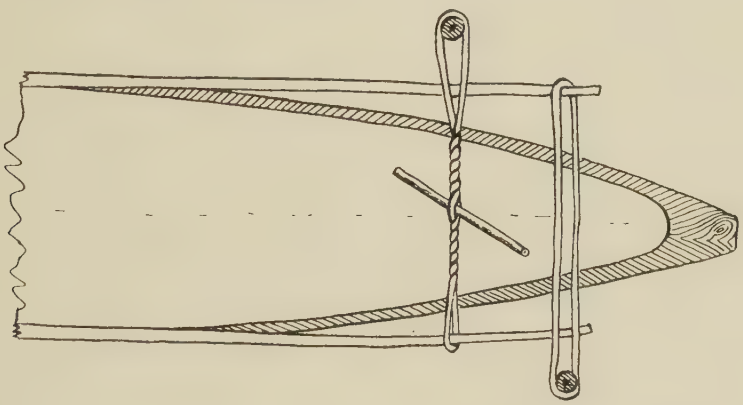
In his description of the Maori method of lashing of side-boards, Colonel Lane Fox remarks that "such a mode of constructing canoes might serve well enough for river navigation, but would be unserviceable for sea craft." This was on account of such vessels being rarely watertight. It is clear that a certain amount of bailing was necessary in the Maori canoe, unless perhaps when the sea was calm; but the holes were carefully caulked, and vessels so fashioned made long voyages across the Pacific.

A description of methods employed in attaching top-strakes, as given by Tuta Nihoniho, now follows: The *niao* (gunwale) of the hull is flat on top, and the bottom of the top-strake is made flat to fit down closely on it. Ere the top-strake was finally placed on the *niao*, strips of the dried butt ends of the *raupo* bulrush were laid along the top of the gunwale, and kept in position with light temporary ties of green *Phormium* leaf passed through the lashing-holes. Then the top-strake is put in position. This great plank is not of a uniform width or depth throughout, being wider in the middle than at the two ends. This is so that it will fit on to the gunwale of the hull by conforming to its sheer. The top-strake is straight-hewn as viewed from above, hence when placed in position the middle part only is resting on the *niao* (gunwale) of the hull; the two ends are some distance out from the hull, owing to the hull being contracted at both ends, whereas the top-strake is straight. In order to draw in the two ends of the long plank it is first securely lashed to the hull in the middle, and a temporary piece of timber is placed across inside the canoe between the two top-strakes, the one on the other side having been fixed in a similar way. The ends of this cross-piece are butted against the two top-strakes so as to keep them in position. Other such temporary cross-pieces are inserted as required. When the fitting of the canoe is finished such temporary cross-pieces are removed. At each end of each strake a post is set in the ground near the side of the canoe, and at each a rope is tied to the post, passed round the end of the strake, brought back to the post, and secured. (See fig. 36, p. 77.) A twitch-stick is then used as a tourniquet, placed between the two ropes, and turned round and round so as to twist the ropes together, which has the effect of drawing in the end of the strake and jamming the cross-pieces in position, and allowing of more lashings to be inserted

and secured. These lashings are merely temporary ties that serve to hold the strake in position while the permanent lashing, a tedious process, is being done; the former are then removed. The temporary lashings are put about every 3 ft., but the permanent lashings are much closer together: those of the "Heke-rangatira" canoe, in the Dominion Museum, are 9 in. apart.

But prior to the lashing being done the two sets of battens laid to cover the join of top-strake and hull, outside and inside, are placed in position, because the lashings are passed over both battens (*kaho*) and hold them in position.

The temporary lashings having been tied fast, small wooden wedges termed *matiti* were driven under them on the inside of the canoe, which rendered them extremely tight and rigid. Thus by lashing the two top-strakes to the hull in the middle, gradually drawing in the ends of the strake by the above-described tourniquet process, and putting temporary braces across inside the canoe from one strake to the other to keep them from being drawn in too far, by making a temporary lashing here and there as the top board came to its lines on the *niao* or gunwale of the hull, the long planks were gradually forced into position, met, and clinched there with lashings and braces. When the extreme ends of the top boards are twitched or drawn into position, a *taumanu*, or thwart, is placed across on the tops thereof, as an additional grip to assist the lashings



[*Sketch by Miss E. Richardson.*

FIG. 36.—METHOD OF CLAMPING HOME THE TOP-STRAKES OF A CANOE. (See p. 76.)

in holding them in position until the permanent lashings are fixed. Because the strain is a heavy one when you force a thick and wide plank into such a curve against its natural inclinations, it resists by endeavouring to regain its natural form, the same being a straight line; hence a heavy strain on the containing agents, be they ties or braces.

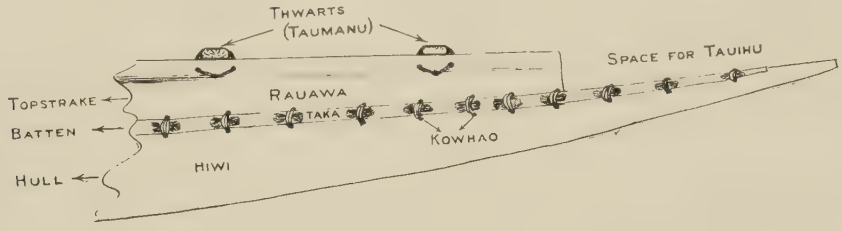
Before applying the tourniquet process to draw in the ends of the top boards, the first part of that labour might be performed by means of fastening ropes to the two ends, passing such ropes across the canoes, when two parties of men tail on to the ropes and haul in different directions. When all possible advantage has been gained by this method, then recourse is had to the mechanical process above described whereby to complete the task.

When the permanent lashings of the top-strake are all fixed, that timber is firm and rigid as though it were a part of the hull; while the lashing on the thwarts, especially when they were scarfed and the shoulders butted against the inside of the two top boards, caused them to act as so many stalwart braces, and the vessel became as rigid as though hewn out of a single log.

The *haumi* might be looked upon as the weakest part of any canoe fitted with that item; but it must be borne in mind that the salvation of the *haumi* is represented by

the two heavy top-strakes so firmly attached to it and the main part of the hull, and that the lashing of the *haumi* to the main part of the hull is quite a minor safeguard. Also, however long the canoe, in no case would there be any join in the top-strake anywhere near the join of the *haumi*. In the construction of any item on such lines the vital process is to break joints. When primordial man evolved the art of breaking joints he had indeed wrought better than he knew. The Maori recognized the advantage of the above process as clearly as do the bricklayer and the stonemason.

The process of lashing the top-strake permanently to the hull is described by the term *aukaha*, and is performed by eight men. These men work in couples, four at

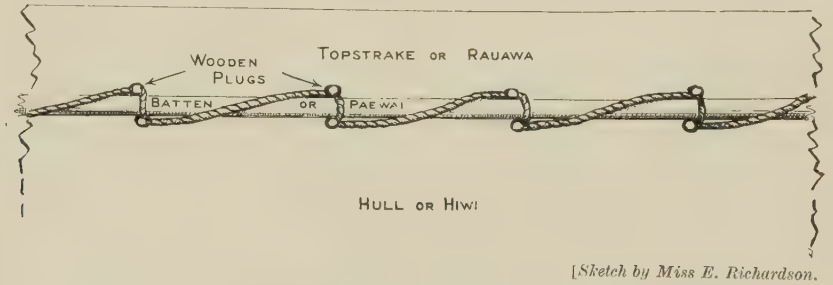


[*Sketch by Miss E. Richardson.*

FIG. 37.—FORE PART OF CANOE, SHOWING ATTACHMENT OF RAUAWA TO HULL.

either end of the canoe, two at each end of the two top boards. We will observe the actions of one of these couples. One of the twain is stationed inside the canoe, the other outside. The pair begin operations at the end of the top-strake, and when one thrusts the cord (*kaha*) through the lower hole his companion pulls it through to his side and returns it through the upper hole, and so on. The two battens are in position, covering the outside and inside of the join; the two holes, one bored through the top board immediately above the batten, the other through the hull just below the batten, are ready to receive the lashing-cord. "*Tena ra! Aukahatia!*"

The end of the cord being secured, the man in the canoe passes the end through to the outside, where it is seized by his mate and passed back through the other hole,

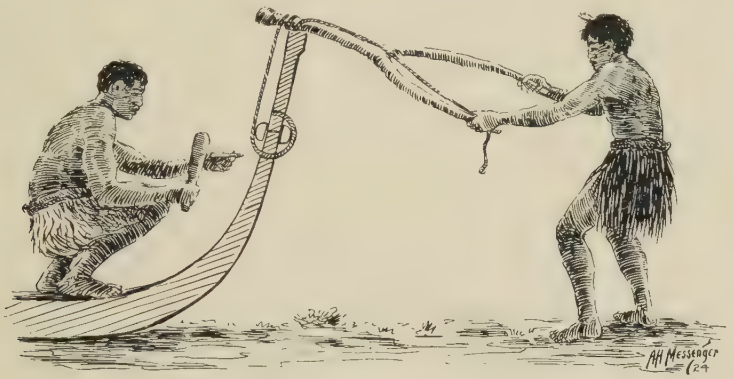


[*Sketch by Miss E. Richardson.*

FIG. 38.—METHOD OF ATTACHING THE RAUAWA, OR TOP-STRAKE, TO THE HULL, AS VIEWED FROM THE INSIDE.

so that it encloses and grips the batten; this process being repeated until two or three turns of the cord have been passed through the holes, which are thereby pretty well blocked. But each time the cord is so passed through a hole it is tightened by the use of an implement termed a *mimiro* among the Ngati-Porou folk, and a *tanekaha* by Tuhoe. (See figs. 39, 40, p. 79). This item is a forked stick shaped like the letter Y, and is a piece of tough or hard wood, such as *toatoa* or *manuka*. The two arms of the Y are the handles by which it is manipulated. When the cord is pulled through the hole by one man, he winds it round the shank of the *mimiro*, runs the free part of the cord up to the end of the handles, round which he makes a few turns with it, and then hands the apparatus to his companion. The latter grasps the handles, holding the twisted cord under the one

hand, places the shank of the implement against the gunwale of the canoe — *i.e.*, the top of the top-strake, which is now the gunwale — and which serves as a fulcrum, and presses down on the handles. By this means he can put a very heavy strain upon the cord, which is stretched and tightened until absolutely rigid and immovable. This strain is held by the man with the *mimiro*, while the other, armed with a mallet, drives a wooden toggle into the hole in order to plug it and prevent the cord slackening. The cord is then unwound from the implement, passed through the other hole, and again



[*Sketch by A. H. Messenger.*

FIG. 39.—MODE OF USING THE TANEKAHA, OR MIMIRO, IMPLEMENT IN THE PROCESS OF TIGHTENING LASHINGS.

tightened by the same process, whereupon the toggle is knocked out and driven into the other hole; or a second toggle is driven into the latter hole, then the first one is knocked out. The lashing of one set of holes being completed, the final passage of the cord being from the outside to the inside of the canoe, the cord is carried along against the inside of the canoe some 9 in. to 12 in. to the next set of holes, which are lashed in the same manner; after which the cord is run along to the next pair of holes, but not so run from the hole of the same level as the last intermediate stretch was made: if the last was led from the bottom hole to the next series, the following lead will be from the upper hole, and so on, alternately from the upper and lower holes. If the cord is led from the bottom hole, then it is first inserted in the bottom hole of the next series; if from the top hole, it runs to the next top hole. As the work proceeds the temporary lashings are removed from the holes and replaced by the permanent ones. (Williams gives *mimiro* as an apparatus used in drawing together the sides of a canoe, and *mimira* as meaning "to fasten on the *haumi*."

FIG. 40.
THE TANEKAHA, OR MIMIRO.

The *kowhao*, or lashing-holes, are then caulked with *tahunga* (syn. *hune* and *tahune*), the pappus of seeds of *Typha angustifolia*. This material is dipped in water and thrust into the hole, wherein it is tamped with a small stick struck with a light mallet.

The outside of the hull of a canoe is hewed to a smooth surface, so as to cause as little friction as possible. When fitted up, the outside of a high-class canoe was in former times painted a dull red with ochre mixed with oil.

The upper part of the sides of the dugout hull (termed *niao* by Tuta) is usually called the *henga*, the former name being reserved for the true gunwale of the completed vessel — that is, the top of the top-strake. In this account the strips of *raupo*, or bulrush-leaf, are placed within the join, while in Mr. Matthews's description of fitting up a canoe they are placed outside, being arranged horizontally along the join-seam both outside and inside the canoe, where they are clamped and confined by the battens

covering the join. The top-strakes were hewn out of clear, straight-grained timber, and the straight plank had to be bent when placed in position, to conform to the curve of the sides of the canoe. In this connection a passage from a work entitled *Adventure in New Zealand*, by E. J. Wakefield (London, 1845), may be here quoted. When Colonel Wakefield, his nephew, and "Dicky" Barrett visited Te Whare-pouri at Nga Uranga (Port Nicholson) in 1839 they found him busily engaged in hewing out a canoe. "The bottom [hull] of this vessel consisted of a single tree hollowed out, and was sixty feet long. The long planks to be added on to the sides were placed between pegs stuck into the ground so as to give them the requisite curvature." Unless these planks were so bent and confined when the timber was green, and allowed to remain until it was seasoned, it is not clear as to what advantage would be gained by this process. The tourniquet process (commonly termed "twitching"), mentioned above, seems to be called *manene* in some places.

A canoe (No. 1869) now in the Dominion Museum is from the Whanganui River, and, although showing European influences, presents some points of interest. This canoe is 42 ft. in length and 4 ft. 3 in. in beam from top-strake to top-strake, while its width across the dugout hull is 3 ft. 4 in., both measurements being across the middle of the canoe, its widest part. The top-strakes of this vessel are both in one piece, each 39½ ft. long. They are 9½ in. wide in the middle, 3½ in. at the stern end, and 5½ in. at the bow end. They extend to within 10 in. of the stern end of the hull, and 1 ft. 9 in. of

[*H. Hamilton, photo.*

FIG. 41.—A FISHING-CANOE (WAKA TETE).

No. 1869 in Dominion Museum, Wellington. (It is the larger canoe, in the foreground.)

the bow end, thus leaving spaces to be occupied by stern and prow pieces, which were attached to them formerly, but have been removed. The top-strake has been adzed down to a thickness of ⅞ in., except its upper part, which, to a depth of 2½ in., is ⅜ in. thicker. This projecting upper part is the *tuangi*. The holes for lashing the top-strakes on are from 8 in. to 11 in. apart at and near the middle of the vessel, but the distance between them is increased towards the ends to as much as 16 in. They are situated about 1 in. from the edges of top-strake and hull, the battens being 1½ in. wide; it is believed that they were wider in former times. In between the top-strake and the *henga*, or top of the hull, is a packing of some substance resembling tow. The lashing-cord is carried on from one hole to another, but not as described by Tuta above; it is carried from a lower hole to the upper one of the next series. In another canoe, 36 ft. in length, the lashing-holes for the top-strake are from 10 in. to 19 in. apart, being closer together towards the middle. They are of an ovoid form, and were probably made with a chisel.

Williams gives *taka* as the name of the batten placed over the outside of the top-strake joint, and *paewai* as the inner one; also *aukaha* as both noun and verb—the lashing-cord employed in securing the top-strake, and the process of lashing with it.

The same authority gives *tokai* as the name for a "strip of wood covering the joints of a canoe," also of the pieces of wood that support the floor or deck of a canoe.

An old canoe in the Dominion Museum of the *waka tete* type is 49 ft. in length and 4 ft. in width in the middle. The two top-strakes are 9 in. wide, or deep, in the middle, and 5 in. at the ends. Each is composed of a single plank, the upper part of which is $1\frac{1}{2}$ in. thick, but 2 in. below the thickness is reduced to 1 in. These planks extend to within 16 in. of the bow end of the canoe, and 12 in. of the stern end, leaving room for the prow and stern pieces to be fitted on. The outer battens covering the join are, however, continued to the very end of the hull, as was usual. The name of this canoe is "Waiapu." (See fig. 42.)

The top-strakes of the "Heke-rangatira," the largest canoe in the Dominion Museum, are, unfortunately, not genuine, and do not represent any Maori form. They are 14 in. in width, and the (alleged) planks carry the same width throughout from stem to stern, which may represent a European top-strake but certainly not a Maori one. (See fig. 14, p. 34.)

[*Maybury, photo.*

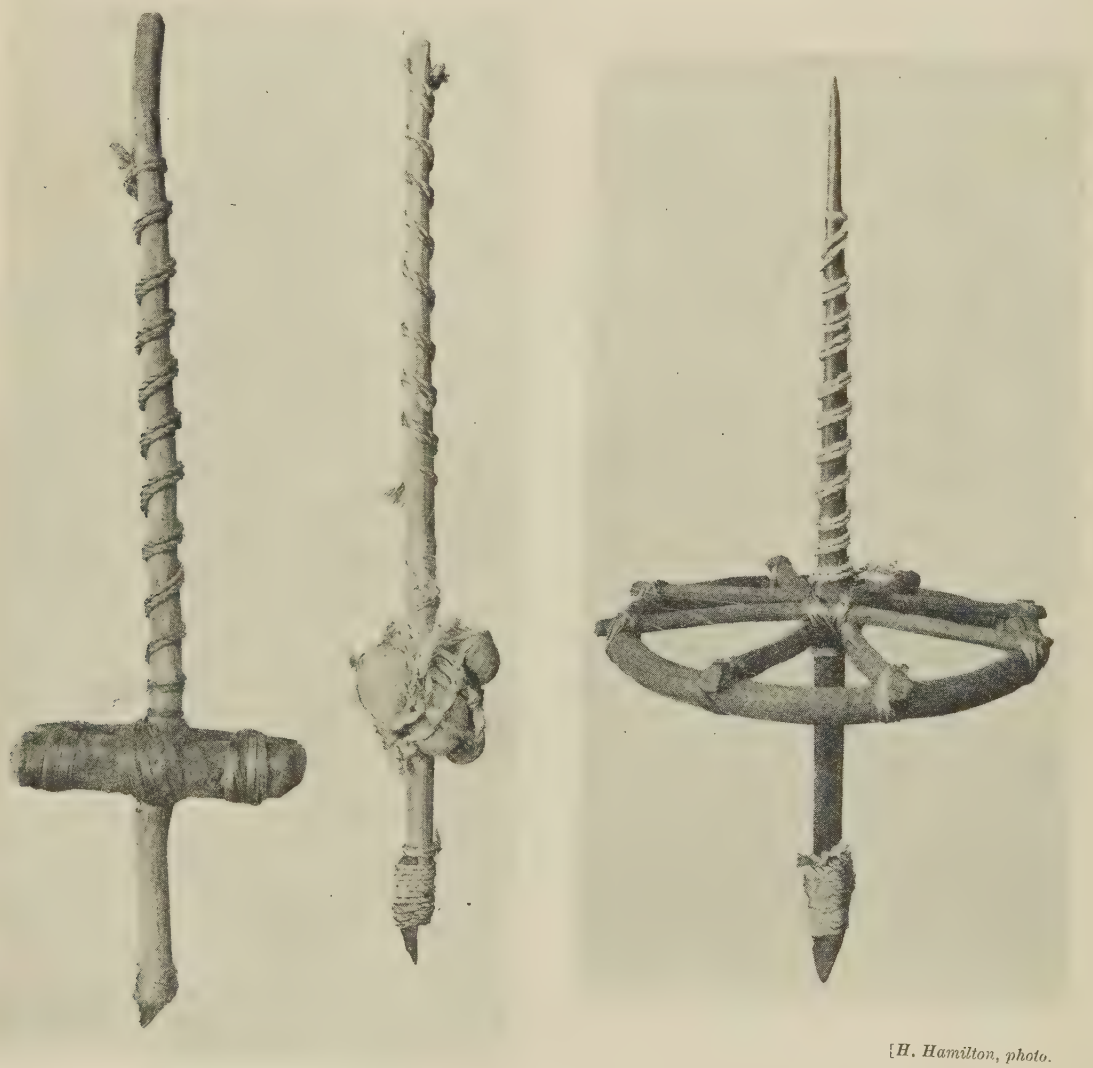
FIG. 42.—THE "WAIAPU" CANOE IN WELLINGTON HARBOUR.

This fishing-canoe was, in 1919, fitted with the appurtenances of a war-canoe, and occupied a place in the pageant on the occasion of the visit of H.R.H. the Prince of Wales.

We are told that the holes (*kowhao*) in the lower part of the top-strake and upper part of the hull, through which the lashings were passed, were pierced with the stone-pointed cord drill, or thong drill. (See fig. 43, p. 82.) This might be done in the case of the top-strake by marking the positions of the holes on the plank and then laying it on the ground to bore it. But in making holes through the edges of the hull by this method the drill-shaft would be horizontal, unless the hull was turned on its side. It is doubtful if a cord drill could be worked satisfactorily with its shaft in a horizontal position. Possibly these holes in the hull were formed with stone chisels; indeed, in many old canoes they are by no means circular, but of an elongated form. The caulking-material inserted in these holes after the lashing was completed sometimes consisted of flax-tow

(*Phormium* fibre) smeared with the gummy substance that exudes from a tree, *Panax arboreum*, known as *pia houhou* and *ware houhou* (*houhou* being the native name of the tree). It is also said that strips of *repehina houi*, the inner bark of *Hoheria populnea*, were sometimes laid in the join of the top-strake, also smeared with the above substance. The caulking-tool employed in plugging the lashing-holes is known as a *turu* or *purupuru;* it was struck with a wooden hammer or club (*ta* or *pao*).

In volume 41 of the *Transactions of the New Zealand Institute* Dr. Newman describes a *purupuru*, or caulking-implement, found by a person when digging a drain at Taradale.



[*H. Hamilton, photo.*

Fig. 43.—Three Forms of the Old Maori Cord Drill. (See p. 81.)

It is of whalebone, and shaped like an English marlinspike, being 14 in. long, and tapering off in a quadrilateral form, not in the round, for some part of its length. Another such implement, made of greenstone (nephrite), is said to have been seen.

Any leakage through the *kowhao*, or lashing-holes, is known as *aurukowhao;* and an old saying is *He aurukowhao, apa he takerehaia* (It is but leakage through the lashing-holes, it is not as though it were a split keel), which is uttered in reference to any minor trouble or accident.

Mr. White gives *papatai* as a specific name for "*raupo* put on the sides of a canoe," apparently under the batten. The covering battens are called *tokai* among some tribes, apparently, while Matthews, a northern writer, terms them *pokai*.

White feathers of the albatross were used in decorating canoes, as for placing under the ties of the battens covering the joins of the top boards and hull. Such ornaments were not confined to the orthodox *waka taua*, but were also used on *waka pitau*, and sometimes fishing-canoes were so adorned. This note was given by Tuta Nihoniho, who thus describes the old method of adorning the black-painted outer batten by means of placing white seabird-feathers at each lashing, the quill ends being gripped by the cord. Tuta also seemed to recognize some difference between the *waka taua* and the *waka pitau*, terms which are generally supposed to be synonymous. As *pitau* is applied to a scroll, it is possible that the latter name was only applied to a canoe possessing that style of carved ornament, though it would also be a *waka taua*.

In the case of first-class canoes the outer side of the top-strake was adorned with carved designs, that known as *manaia* being a favoured one. Such carvings covered the wide lower part of the plank, while the outer side of the narrow and projecting upper part (*tuangi*) was carved with a different design, such as the *pakura* on the "Heke-rangatira" canoe. The top-strake would finally be painted red with a paint composed of red ochre and oil.

Fig. 44.—Two Sections of Carved Top-strakes of a War-canoe, in Canterbury Museum.

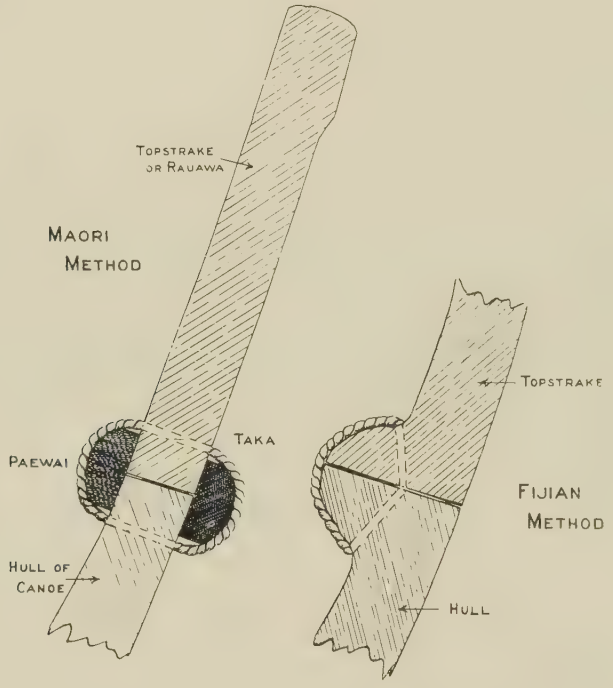
Of some canoes seen at Whangarei in 1827 D'Urville writes: We met the three canoes of Rangi, which were coming off. The largest was ornamented both fore and aft with plumes and tufts of hair, and the whole length of its topsides sculptured in bas-relief, painted in red, often enriched with shell, the whole executed in the best New Zealand taste."

Nicholas, writing in 1815, has the following: "The canoe . . . was very handsome, the head and stern being curiously ornamented with rich carving, and embellished with the feathers of the emu, parrots, and other birds. The bottom part of the canoe was made out of one tree excavated to the necessary length; and the sides were raised by planks, making the depth about two feet. The planks were fastened to the sides of the bottom part with strong cord, holes being bored above and below, about six inches apart, and the intermediate space filled in with down of the bullrush, which was no bad substitute. I estimated the length of the canoe at thirty feet, and the breadth was four feet six inches between the gunwales. All their canoes are generally built on the same plan, differing only in dimensions and certain adventitious embellishments."

The emu-feathers must have been absent, and parrot-feathers would apparently be a rarity, as connected with canoe-adornment. If only 30 ft. in length the craft was a very diminutive one for a *waka taua*.

The top-strake is usually called *rauawa;* Te Rangi-hiroa says, sometimes *awa* (see *Dominion Museum Bulletin No. 3*, pp. 92-99). In the dialect of Niue, or Savage Island, we find *oa* as the name of the top-strake, and also at Mangaia, in the Cook Group.

The following is a brief account of fitting up a canoe, as given by R. H. Matthews; it refers to a scene witnessed in the far north:—"All along the *tauranga* (anchorage, landing-place) were canoes of all sizes, from the large *waka taua* (war-canoe) to the small *tiwai*. Several of the *waka taua* were surrounded by a busy crowd of workmen: some were lashing on the bow-piece with its ornamental panel and figurehead, called a *pitau*, others were fastening on the tall elaborately carved *rapa* (stern-post), while others again were fitting and lashing the *rauoa* (top-strake). This plank is called *oa* when free, but *rauoa* when fastened in position. Carefully selected leaves of *raupo* (*Typha*) were placed over the joints inside and outside, and were clamped firmly together by means of the *pokai*, or battens, which were then securely lashed by cords of three-plait



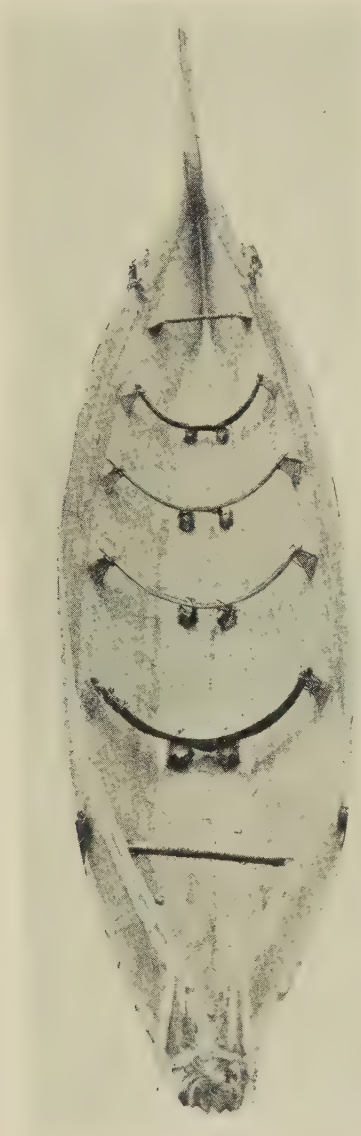
[*Sketch by Miss E. Richardson.*

FIG. 45.—ILLUSTRATING THE MAORI AND THE FIJIAN METHODS OF LASHING TOP-STRAKE TO HULL.

flax-fibre. All holes were filled or caulked with *hune* (down from the seed of *Typha*). The *tauare*, or thwarts, were placed in position, and carefully lashed. A separate gang of workers was employed in making the *raho*, a movable platform. . . This was fitted in sections under and between the thwarts, extending from stem to stern, and forming a kind of deck. . . Apart from the rest was a particularly fine specimen of a war-canoe, named 'Kai-pititi,' newly painted with *kokowai* (red ochre), and adorned with a beautifully carved figurehead and stern-piece. The outside battens were dressed from end to end with the white feathers of the albatross and gannet."

The Maori method of securing the top-strake of a canoe, as shown in the diagram, was that practised in eastern Polynesia, whence it was introduced into New Zealand. In the western region of Polynesia, however, a different method obtained in some islands, for these folk had borrowed the Fijian mode of attaching the strakes. (See fig. 45.) This

was so at the Tongan, Samoan, and Ellice Groups. In this method the planks and hull were not pierced with holes, hence no lashing appeared on the outer side, and no batten was used. On the inner side of each plank the hewers, in dressing them



[*H. Hamilton, photo.*

FIG. 46.—INTERIOR OF A MODEL CANOE OF SOME ISLE OF THE PACIFIC.

Illustrating a peculiar stage in the evolution of the true ribbed built-up boat. This model is in the Dominion Museum, but has no number and cannot be located.

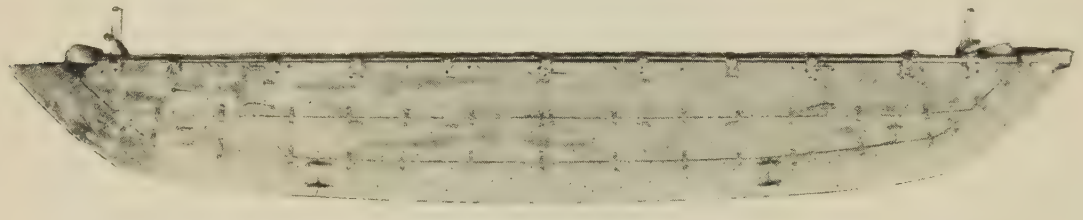
The intention of the writer of this paper was to collect illustrations of the development of the built-up ribbed boat as exemplified in many parts of the Pacific; also of the development of the decked vessel, the cabin; with different forms of paddles, of prow projection, of methods of securing outrigger floats, &c. All this interesting comparative work has had to be abandoned owing to the long postponement of the preparation of illustrations.

with the adze, left cants or raised rims on the edges, and one was formed on the inside of the top of the hull. When the plank was placed in position on the top of the hull the two projecting rims were in close contact, and holes were made through

these for the lashing-cords to be passed. Thus the inner rims of the planks were lashed together, no lashing passing through the body of the plank itself. Many of the island canoes were built up in carvel fashion by attaching several tiers of planks to a low dugout hull, all fastened together in the manner described. There is no proof that this method was ever employed by the Maori of New Zealand.

In his paper on "Early Modes of Navigation," Colonel Lane Fox extends the raised-rim method of securing side-boards to Tahiti and Easter Island, on the authority of Captain Cook and La Perouse. A perusal of the works of those voyagers has failed to locate any such information. The authorized account of the voyage of La Perouse, published in 1799, gives no information as to the Easter Island mode of lashing canoes. In Hawkesworth's narrative of Cook's sojourn at Tahiti we note the following in a description of the canoes seen: "To fasten these planks together, holes are bored with a piece of bone that is fixed into a stick for that purpose . . . and through these holes a kind of plaited cordage is passed, so as to hold the planks strongly together: the seams are caulked with dried rushes, and the whole outside of the vessel is paid with a gummy juice which some of their trees produce, and which is a very good succedaneum for pitch."

In this account there is no evidence that any method of interior-rim lashing was employed by Tahitians. Ellis, in his detailed description of Tahitian canoes, shows that the planks were lashed together in the Maori method.



[*H. Hamilton, photo*

Fig. 47.—Model of Canoe of Gilbert Group, showing Maori Method of Lashing.

Colonel Lane Fox also quotes Wallace in his statement that the natives of the Ke Islands, west of New Guinea, employed the raised-rim method of fastening planks: "The planks here, as in the Polynesian Islands, are all cut out of the solid wood, with a series of projecting ledges on their edges on the inside. But here we find an advance upon the Polynesian system, for the ledges of the planks are pegged to each other with wooden pegs." In referring to Wallace's work, however, we find that no mention is made of any flange, cant, or raised rim formed on the edges of the planks that form the built-up sides of these canoes. There is a series of projecting pieces left along the centre of each plank, to which the ribs are lashed, but these ribs are not inserted until after the side-planks are secured in position. These side-planks are fastened together by wooden trunnels driven into holes bored in the edges of the planks—apparently a butt joint, though this is not made clear in Wallace's account. The available evidence does not make the matter clear.

A model of an outrigger canoe of the Gilbert Group shows the lashing of the *haumi* joins and of the successive strakes as passed right through the planks, and the lashing shows on the outside in all cases. (See fig. 47.) A number of ribs are neatly arranged inside the hull, and the side-planks are secured to these knees by means of lashings passed through the planks and showing on the outside. The hull is a small one, and is composed of three pieces.

An interesting outrigger canoe of Manihiki Isle in the Dominion Museum shows two modes of joining and lashing. The hull, which is in three pieces, is lashed as in the

case of the Gilbert Island craft. The three planks composing the top-strake are butt-joined and lashed in a similar manner. But the joining of the hull and top-strake shows no lashings on the outside, the connection being made by means of an extremely ingenious and neat rim or cant lashing. In this small craft we have illustrations of both methods. (See fig. 150, p. 209.)

A curious mode of attaching the top-strake of the canoe of Niue, or Savage Island, is described by Te Rangi-hiroa in *Dominion Museum Bulletin No. 3:* "This board is known as the *oa*, and corresponds to the Maori *rauawa*, or *awa*, as it is often called. The lower edge of the *oa* is grooved, and the inner lip, which is elongated, and projects downwards, is drilled for lashing to the hull, the holes thus not showing on the outer surface of the *oa*. The groove of the *oa* is known as the *kaupu-oa*." No information is to hand as to whether or not this method is employed at other islands. In some notes on a model canoe from Mangaia, in the Cook Group, published in the same work it is stated that the top-strake is called *oa*, while in a canoe-hull formed of two pieces the foremost one is called *aumi*, both of which are Maori names.

Dr. Elmore informs us that a curious method of fastening together the side-boards of a canoe is practised in the Solomon Group. These vessels are carvel-built, and the edges of each plank are chamfered or bevelled off so as to leave a slot like a shallow V along each join, on both sides. In order to lash these planks together holes are bored near the edges, and cords passed through as in Maori vessels. No covering batten seems to be employed, but after the lashing is completed the long groove of each join, on both sides, is filled up with a tenacious gum, presumably a vegetable product, this gum projecting somewhat as a slight ridge all along the seams.

Interesting reference to canoes are met with in old native traditions. Thus in the legend of Rata we note the following remarks concerning the making of his canoe. This occurred in Polynesia, whence that vessel is said to have made a long voyage to a far land:—

Na, ka mahia te waka, a ka oti te tarai te haumi, te kei, te ihu, nga rauawa. Ka oti nga taumanu, te tauihu, te rapa, me te karaho, te puneke o te ihu, te utuutu-matua, te whakarei o te kei, nga mea katoa mo te waka taua; nga korewa, nga ta wai, nga hoe, nga whiti, nga tokotu, nga huapae, nga ra, nga taura, nga punga e rua, whakawhenua, nga punga korewa, nga toko waka, nga hoe whakaara o te ihu, nga hoe whakatere o te kei.

(Now was made the canoe; the *haumi*, the stern, the bow, the top-strakes were hewn out. Completed were the thwarts, the figurehead, the stern-piece and the flooring, the *puneke* of the bow, the *utuutu-matua*, the *whakarei* of the stern, all things pertaining to the war-canoe; the outrigger floats, the bailers, the paddles, the awning cross-rods, the awing stanchions, the longitudinal spars, the sails, the cordage, the two ground-anchors, the sea-anchors, the canoe-poles, the lifting-oars of the bow, the steer-oars of the stern.)

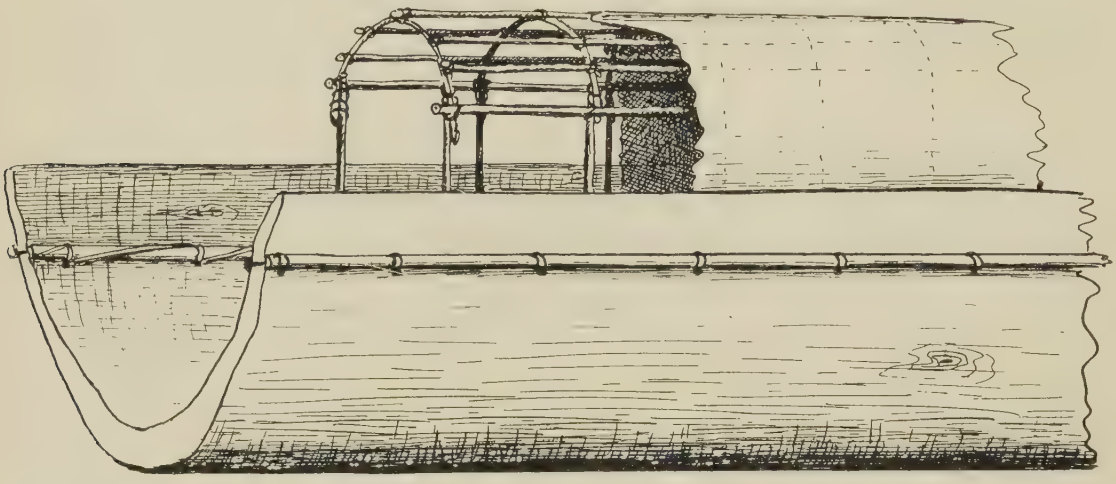
Here we have evidence that the vessel was an outrigger canoe provided with a *mahau*, or awning. (See fig. 48, p. 88.) The *whakarei* of the stern is mentioned as though it were a different item to the stern-piece (*rapa*). *Puneke* is apparently a variant of *punake*. The reciter omitted some items, as the outrigger booms, &c. *Huapae* is usually applied to the fore-and-aft spars lashed across the booms, and parallel with hull and float. In another account we find "*Ka oti te tamau rawa nga hokai me nga huapae*" ("The making-fast of the booms and longitudinal spars was completed").

As for the *utuutu-matua*, the term *matua* is applied to the deepest part of the hull of a canoe, and it is possible that the above term denotes the bailing-place at that part. *Utu* signifies "to dip up." A remark in the first volume of White's *Ancient History of the Maori* tends to support this view: "Rata went to the plug of the *utuutu-matua* and pulled it out" (see page 67, Maori part). The translation of this passage at page 77 of the English part is misleading.

At the risk of being tedious, another extract from tradition is given below, as recited by Te Matorohanga some fifty years ago:—

Mana e rangahau mai he tohunga tarai whakarei tere moana, haumi, rauawa tu tahi, tu rua, tu toru, tu wha, me nga pairi, me nga karawhi, me nga paewai, me nga huapae, me nga tokotu, me nga taumanu, me nga karaho, me te tauihu, me te rapa, me te haumi o te ihu, me te haumi tauaro o te kei, me te kauhora takapau, me nga torowhiti, me nga kauawhi o te mahau whakarei, me nga korewa, me nga tataa, e rua pae wai, e rua tataa tarawai, me nga turuturu kauawhi o nga rauawa, me era atu whakarawe o te waka pairi e oti ai te kauhora i te Moana nui a Kiwa . . . nga uhirau, me te kauawhi pehi o runga o nga torowhiti, te whakarei kauhora moana, me nga punga whakawhenua e rua, me nga punga korewa e rua, me nga punga terewai e rua, kia kotahi mo te kei, kia kotahi mo te ihu, hei punga tutoro. Ko nga hoe whakatere e rua, me nga hoe whakaara o te ihu o te waka, me nga hoe whakaumu, me nga hoe tairanga—ma ratau enei e mahi mai.

(His the task of seeking experts at hewing out ocean-sailing vessels—hull-extensions, single, double, triple, and quadruple side-boards and wash-strakes, and ribs, and battens, and the longitudinal spars, and the stanchions (or masts), and the thwarts, and the flooring-timbers, and the figurehead, and the stern-piece, and the fore *haumi*, and the after *haumi;* and [making] the flooring-mats, and the awning roof-rods, and the awning-battens, and the outriggers, and the bailers (two small and two large), and the side-board supports, and other fittings of the *waka pairi* . . . the awning-coverings and the battens on the cross-rods, the *whakarei kauhora moana*, and the two ground or holding anchors, and the two sea-anchors, and the two sounding-weights (one for the stern and one for the bow) to sound with, and the two steering-oars, and the two lifting-oars of the bow of the canoe, and the *whakaumu* paddles, and the *tairanga* paddles—theirs be the task of making.)



[*Sketch by Miss E. Richardson.*

Fig. 48.—The Mahau, or Canoe-awning, as used on Deep-sea Vessels.

The reference to side-boards as being double, triple, &c., is interesting, and a common usage in Polynesia. The *karawhi* and *turuturu* are said to be forms of ribs or braces inside the hull, to which the side-boards were attached. The term *tokotu* was applied to the stanchions supporting the awning-roof, but masts are sometimes so named. *Haumi tauaro* is a new expression to me. *Torowhiti*, *whiti*, and *whiti tu* seem to be all names applied to the curved rods supporting the awning. Of the two series of *kauawhi* mentioned, one appears to be the light roof-battens of the awning, but the other is as yet unexplained; they may have been *tatami*, or clamping-rods secured outside the *uhirau*, or awning-mats. The expression *whakarei kauhora moana* is unknown to me, and *whakarei* seems to carry some meaning other than those found in dictionaries. The *punga terewai* was a stone weight attached to a cord and used for sounding purposes, also to detect currents. The expressions *whakaumu* and *tairanga* imply deep and light paddling, and possibly were applied to paddles of different sizes.

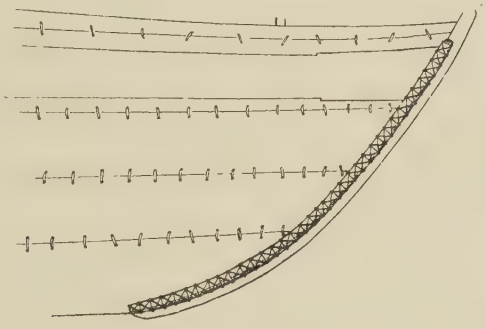
In one account of the "Takitumu," a vessel that reached these isles from eastern Polynesia about five hundred years ago, it is said that "she was built up by means of

six strakes," and this would mean that the true hull was very low-sided, a common feature of canoes of that region.

It is interesting to note references to the double outrigger in the extracts given above. There is some further evidence extant as to its former use in Polynesia.*

Thwarts (Taumanu).

The thwarts of a canoe are termed *taumanu*, *tauare*, *tauware*, *keretu*, *ama*, and *kiato*. The latter word is, in Polynesia, applied to the booms connecting the float of an outrigger with the canoe. Tregear gives *whakarei* as the name of "the high priest's seat,

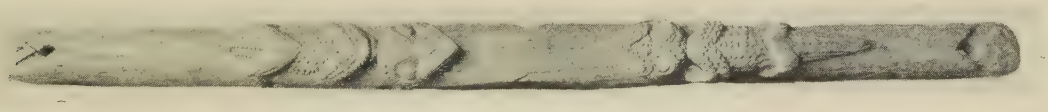


[*Sketch by Miss E. Richardson, after J. Hornell.*

Fig. 49.—A Masula Boat of Madras.

Showing strakes attached as is the *rauawa* of a Maori canoe. The lashings pass right through planks.

carved and ornamented with feathers, at the stern of an ancient outrigger canoe." The stern thwart is said to have been occupied by the two steersmen, the *tapu* seat or thwart being forward of the one so occupied. Not that natives sat on thwarts to any extent. In smaller vessels the two thwarts next the stern were occupied by the steersmen; the third one was known as *ruanuku* among the east coast natives, and was occupied by the principal man or men on board the canoe. In coastal voyages such a chief might assist in the steering. It seems that a thwart occupied by a *tohunga* (priestly adept) or an important chief (in some cases these two offices were combined in one person) might be adorned by carved designs, and there is such an item in the



[*H. Hamilton, photo.*

Fig. 50.—An Old Canoe-thwart, in Dominion Museum.

Showing two lizards carved in high relief.

Dominion Museum. This thwart is of a peculiar form, and it does not appear probable that it was ever used as a seat; if it was, then it must have been a most uncomfortable one. It may have been a *tapu* or ceremonial thwart, pertaining to a *tapu* person. The carved figures of two lizards on its upper surface are in high relief, $1\frac{1}{2}$ in. at the head, and the space between the two heads is but $9\frac{1}{2}$ in.—too narrow for a seat. The total length of the thwart is 5 ft. 5 in. The width of the canoe to which it belonged (inside measurement) was 4 ft. 10 in., as shown by the distance between the two shoulders of the scarfed ends, where fitted on to the gunwale—*i.e.*, the upper edge of the top-

* See *Journal of the Polynesian Society*, vol. 32, p. 200, for a paper entitled "Did Polynesian Voyagers know the Double Outrigger?"

strake. The tang or projecting part of the ends is 3 in. in length, which probably represented the width of the top of the strake. Through each end of the beam a hole has been pierced to pass the cord through whereby it was lashed to the gunwale of the top-strake. This hole is situated just on the inner side of the shoulder, and slants inward, as also does the scarf, an accommodation to the inward trend of the side of the vessel. Both holes are of rough outline, irregular, and one looks as though it had been roughly chiselled out, not bored. Two slots, diverging outwards from the holes, show that the lashings were countersunk. The carved representations of lizards are very prominent, and one is 1 ft. $4\frac{1}{2}$ in., the other 1 ft. $5\frac{1}{2}$ in., in length. One has pieces of *Haliotis* shell inset as eyes, while both are covered with lines of small serrations known as *taratara-o-kai*. Why these creatures should be carved on a thwart is not clear. The lizard appeared not infrequently in Maori carvings, and is also found in those of Polynesia and Melanesia. Judging from the appearance of the serrations and of the dressed surfaces, this thwart has been fashioned with metal tools, though apparently it is fairly old. The wood is *totara* of that honeycombed texture known to the Maori as *tatarapo* and *kaikaka*.

In the account of the "Takitumu" canoe and its coming from Polynesia, as preserved in tradition, we note evidence of the Maori custom of applying special names to objects. This vessel had twenty-six thwarts, each of which had its proper name. The stern thwart was named "Te Ra-kura"; it was occupied by Rongo-patahi, Rua-wharo,

A B

[*Sketches by Miss E. Richardson.*

FIG. 51.—THWARTS.

Diagram A shows bosses left in the interior of a canoe-hull as supports for thwart, as seen at Whanganui by Mr. T. W. Downes. Diagram B shows hard knots in the interior of a canoe-hull, left by the hewer lest his stone tools be fractured.

and Tupai, the three wise men or priestly adepts of the voyagers. The next thwart was named "Te Paerangi"; the next was "Te Pae-taku"—it was occupied by Tamatea-ariki-nui and his friends; the next was "Rakau-amoamo," occupied by Hape-ki-tuarangi; and so on. In this case the priestly adepts seem to have occupied the stern thwart; perhaps the next one, "Te Paerangi," was awarded to the steersmen. Tamatea, who was the principal man on board, occupied the third thwart.

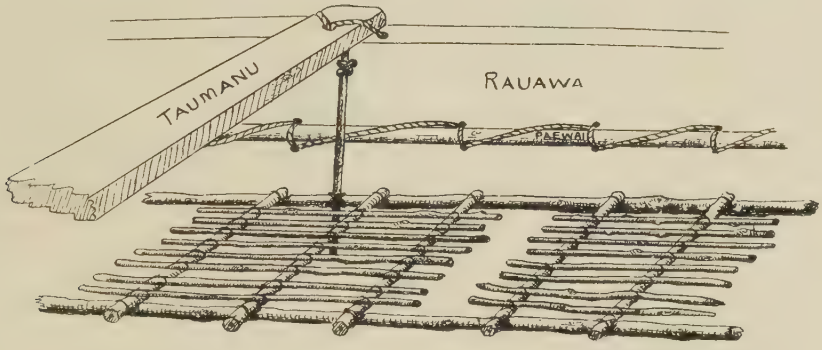
In some cases thwarts were scarfed so that the shoulder rested against the inner edge of the top-strake; in others the ends simply rested on the top-strake.

The spaces between the thwarts are termed in some cases *taitua* and *wa patiki;* but Taringa-kuri, of Te Atiawa, stated that *whariu* is the special and correct name for it. Williams gives *tauware* as the name of this space.

The following notes were contributed by Tuta Nihoniho, of the Ngati-Porou Tribe, of the east coast: The *taumanu*, or thwarts, were sometimes laid flat on top of the flat-topped *rauawa* (top-strake), and in some cases were provided with a shoulder so as to fit on, the two shoulders being dropped inside the inner edges of the *rauawa*. The ends of the thwarts were, as a rule, a little inside the outer edge of the top board, and never projected over it, or they would interfere with paddling operations. In order to

lash the thwart on to the gunwale, or top of the *rauawa*, one hole was bored through the centre of the thwart about 4 in. from the end thereof, then two holes were bored through the top board, or gunwale, one on either side of, and close to, the thwart, and about 2 in. from the inner edge of the gunwale. These two holes were bored diagonally from the flat top of the side-boards so as to emerge on the inner side—*i.e.*, inside the canoe, $2\frac{1}{2}$ in. or 3 in. below the thwart. (See figs. 52 and 53.)

The end of the lashing-cord was secured to the end of the *tokai* of the floor, which was put in position at the same time, and the cord was then passed up through the *taumanu* and over it, down through the hole at the side into the canoe, up through the thwart again, over it, and down through the other hole through the top board. This reeving was repeated so as to present a double cord all round; the top of the thwart was in many cases grooved, so as to countersink the lashing, which thus formed no projection. (See fig. 53, p. 92.) The hole bored through the thwart was not always perpendicular, but sometimes inclined inwards like those of the gunwale, thus bringing the three holes more in line on the top than they would otherwise be, and so facilitating the work of lashing. The lashing of the thwarts is strained and tightened by means of the *miniro*, as in the case of the top-strake lashing.



[*Sketch by Miss E. Richardson.*

FIG. 52.—LASHING OF THWART AND METHOD OF SUPPORTING FLOOR.

There was occasionally a little carving at the extremities of the thwarts of important canoes, and possibly a little in the middle, but never any on those parts used as seats. In some cases a human head was carved on each end of the thwart.

In the case of big canoes two paddlers sat on each thwart, one at each side of the vessel; in some cases a relief, or even two, sat between them. These reliefs changed places with the paddlers when the latter grew weary. In smaller canoes paddlers often kneel or sit on the flooring of the vessel. Again, the smaller and inferior class of canoe, as seen used for river work, have no thwarts or flooring.

The thwarts on the "Heke-Rangatira" canoe are about 27 in. apart, which spacing would do for a fishing-canoe; but in the big ocean-going canoes the thwarts were spaced much wider, and a certain number of individuals, often a family, occupied each such space. It was the custom, in ocean voyages, to assign each thwart to a man and his *hunuku* (family and baggage), or to a number of single men. In some of the old-time ocean-going canoes it is said that each space between two thwarts would accommodate eight persons. This would mean a space of a considerable size. When a very big canoe was being paddled there would be four men on each thwart, the two outer ones paddling, the two inner ones to relieve paddlers, the others reclining between the thwarts. The latter relieve those on the thwarts.

The thwarts of a canoe were always of an even number. Canoe-thwarts were often made of *matai* (*Podocarpus spicatus*), the *totara* wood being of too brash a nature for the purpose. The following note seems to have a local application: The first *taumanu*, or thwart, at the stern of a canoe, immediately in front of the chief's seat (which is a small seat just in front of the base of the stern-piece), is known as the *taumanu whakahaere*. The same name is applied to the thwart nearest the bow. The men on these thwarts are those who control the canoe when a rough sea rises.

The beams used as thwarts were usually split out of durable heart-wood and dressed with stone adzes to required dimensions. Splitting logs and baulks was done with hard-wood wedges and wooden beetles. Among the Ngati-Porou tribesmen the following terms were applied to a set of wooden splitting-wedges:—

(1.) *Ora pipi:* Small thin entering-wedges.

(2.) *Ora whakatangitangi:* Somewhat larger wedges, to follow the entering-wedges. These cause the first sound of rending to be heard, as the name implies.

(3.) *Ora wahi:* A yet larger form. The name denotes splitting or dividing wedges.

(4.) *Ora whakapakaru:* Bursting-wedges. A big heavy form that completes the work of bursting the log open.

[*Sketches by Miss E. Richardson.*

FIG. 53.—ATTACHMENT OF THWARTS TO TOP-STRAKE.

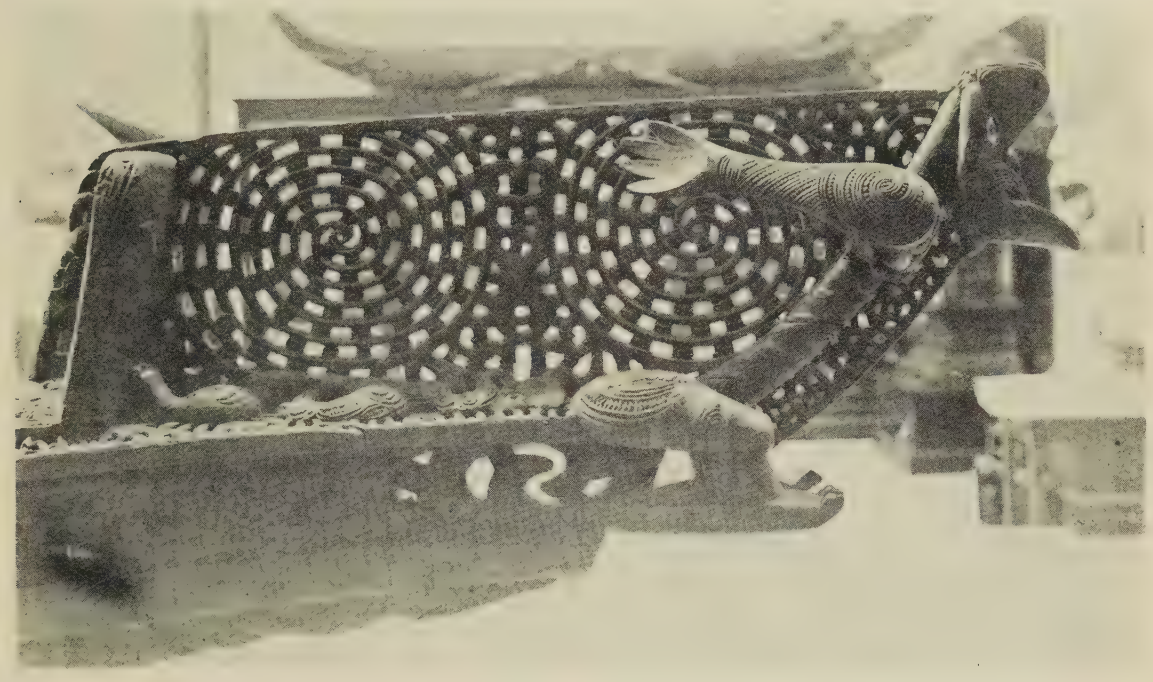
A, as viewed from above; B, as viewed from outside canoe. This shows an inferior method. The lashings should emerge inside the canoe, as in fig. 52.

Splitting-wedges were made from hard and tough woods, such as *maire* and *taiki kowhai*, the latter being the weathered heart-wood of *Sophora tetraptera* from which all sap-wood has decayed. Wedges are called *matakahi* and *makahi* in some districts. *Mata-pipi* is another name for the *ora pipi* above, while *kaunuku* is applied to a large form in the Bay of Plenty district. The wooden maul or beetle used in splitting is termed a *ta* or *pao;* it was often a club of hard *maire* wood, somewhat resembling a huge fern-root pounder in form.

Inasmuch as the canoe possesses no frame, it is clear that the many stout thwarts tightly lashed to the top-strakes serve to render the superstructure rigid and immovable. These thwarts are the true braces that secure the top-strake, and the latter, in the case of a *waka haumi*, is the agent that renders rigid the dugout hull composed of two or three pieces. The lashing of the several pieces of the hull together is by no means so effective. Thus a *waka haumi* without a top-strake would be almost useless, and a canoe with topsides must have thwarts to grip and strengthen them.

The Tauihu, or Figurehead.

The form of the *tauihu*, or figurehead of the Maori canoe, in its different designs, is shown in the illustrations given. This item, often highly ornate, has flat edges at the bottom, and a square rear end on each side to butt against the square forward

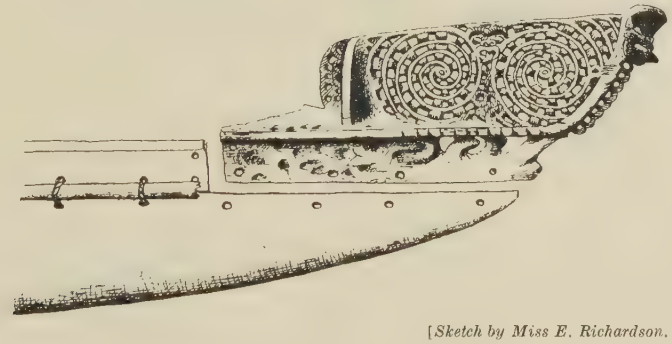


[*Photo, Dominion Museum Collection.*

Fig. 54.—Prow of "Toki-a-tapiri" Canoe, in Auckland Museum.

Illustrates mode of attachment of *tauihu*. The hands of the grotesque carved figure have a non-Maori aspect.

ends of the two top-strakes of the canoe. The *tauihu* is secured to both the top-strakes and to the two sides of the hull of the canoe underneath by the usual method of lashings, passed through holes bored through the various timbers. Thus the figurehead (also the stern-piece) rests on the hull, is butted against the two *rauawa*, or top-strakes, and



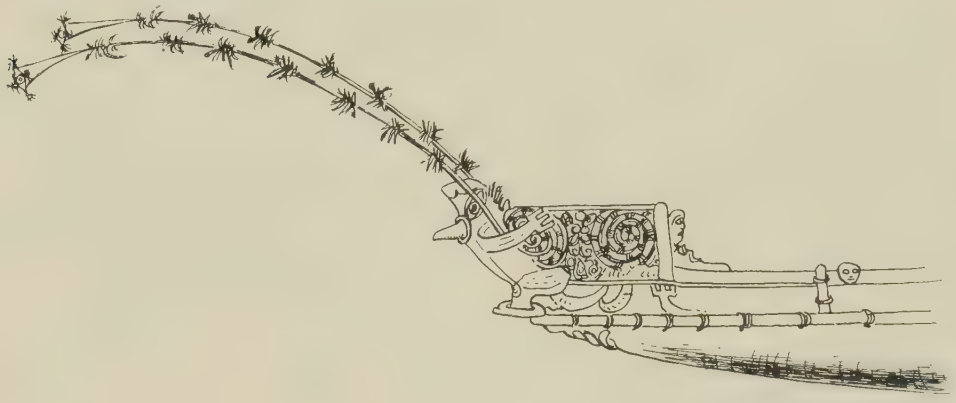
[*Sketch by Miss E. Richardson.*

Fig. 55.—Showing Fitting and Attachment of Tauihu.

is tightly lashed to all. The battens that cover the join of the *rauawa* and hull, inside and out, are continued to cover the join of the *tauihu* and the hull, even to the extremity of the latter. The joins are covered with pads of *raupo*, termed *tupa*. There is no open space between the figurehead and the hull at any part; the fittings of the

canoe in the Dominion Museum do not belong to it, and are no criterion. The making of one of the elaborate figureheads was the labour of years, but such work was always done in an intermittent manner, and was sometimes finished by the next generation.

A canoe that has no *tauihu*, and either no stern-piece or only a very common, plain one, is described as a *tuki* on the east coast, and such a craft may or may not have a *haumi* and *rauawa*. In such a canoe the figurehead is replaced by a plain piece of wood, pointed or square cut at the forward end. Again, any canoe fitted with a *haumi*



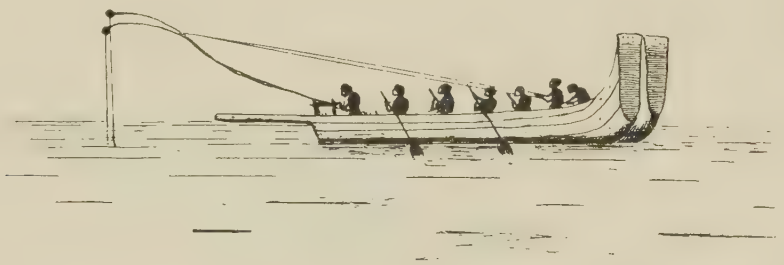
[*Sketch by Miss E. Richardson.*

FIG. 56.—IHIIHI, OR HIHI, OF WAR-CANOE.

Shows attached *tauihu*, also the long, projecting wands termed *ihiihi* and *hihi*. The peculiar designs at the extreme outer ends of the wands are termed *karu atua*.

is described as a *waka haumi*, and a canoe hewn from one log, with no *haumi*, is called a *kotore-puni*. These are merely descriptive names, explaining structural peculiarities.

The long wands projecting forward from the figurehead are known as *ihiihi* and *hihi*, and are usually slim rods of *manuka* or *tanekaha* wood. (See fig. 56.) The long feather ornaments are known as *puhi*. Small bunches of feathers were also tied on the rods at intervals. These projecting rods form a singular feature in prow-ornamentation, and one



[*Sketch by Miss E. Richardson, from Ellis's "Polynesian Researches."*

FIG. 57.—PECULIAR FISHING-DEVICE OF TAHITI.

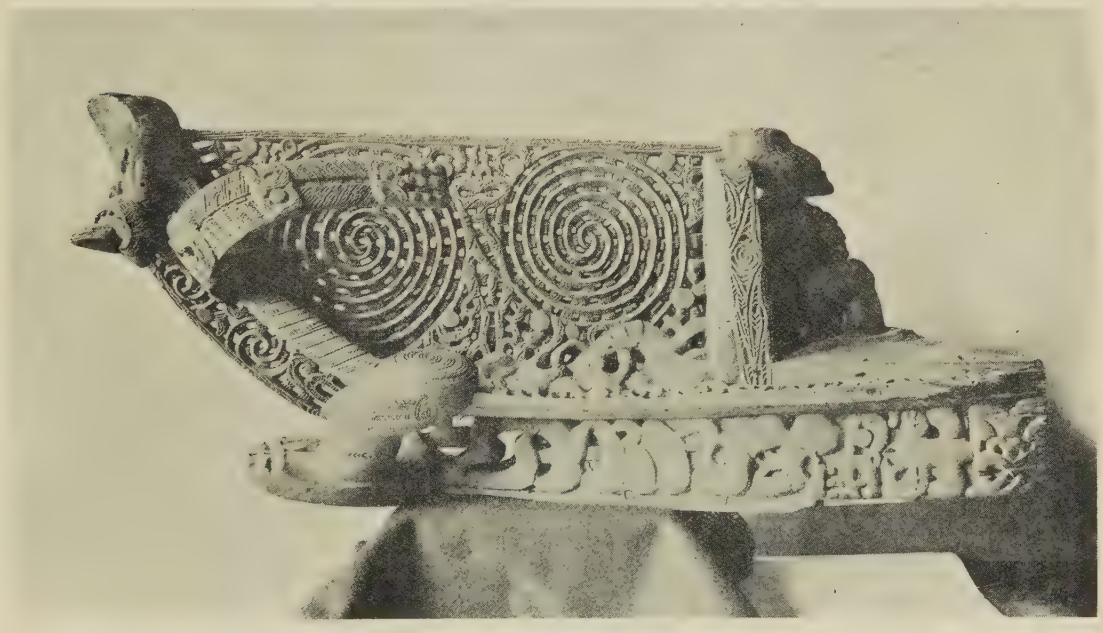
Lines suspended from a long pole, pronged at outer end. Possibly the prototype of the Maori *ihiihi*.

can but wonder what was the origin of such an object. The device bears a curious resemblance to one illustrated in Ellis's *Polynesian Researches* (2nd ed., vol. 1, p. 148). (See fig. 57.) Here we see a long rod with two curved prongs projecting from the prow of a fishing-canoe. At the extremities of the prongs are bunches of feathers, and to them also were secured fishing-lines. This was a mode of taking such fish as bonito.

The *tauihu* are painted with red ochre mixed with oil, as also the stern-piece. The two different forms of *tauihu* are shown in the illustrations.

The figurehead of the *waka taua* class of canoe is a highly ornate object, and one of the finest examples of Maori wood-carving, as will be seen by referring to the illustrations given. Brown, in his work on New Zealand, writes as follows: "Figureheads may sometimes be seen with a great deal of carving on them, but, after all, it is rudely executed, and is remarkable chiefly for its regularity, and the vast amount of time and patience which must have been expended on it. These specimens of art seem to be copies of each other, which shows the poverty of their inventive genius. They take great care of these figureheads, so that they are frequently fitted to new canoes after the original ones have been destroyed—another evidence of the difficulty of producing them."

These remarks are scarcely just. A well-finished figurehead was by no means rudely executed. The similarity noticed was not the result of "the poverty of their inventive genius," but of the conventional aspect to which all decorative art had attained prior to the advent of Europeans.



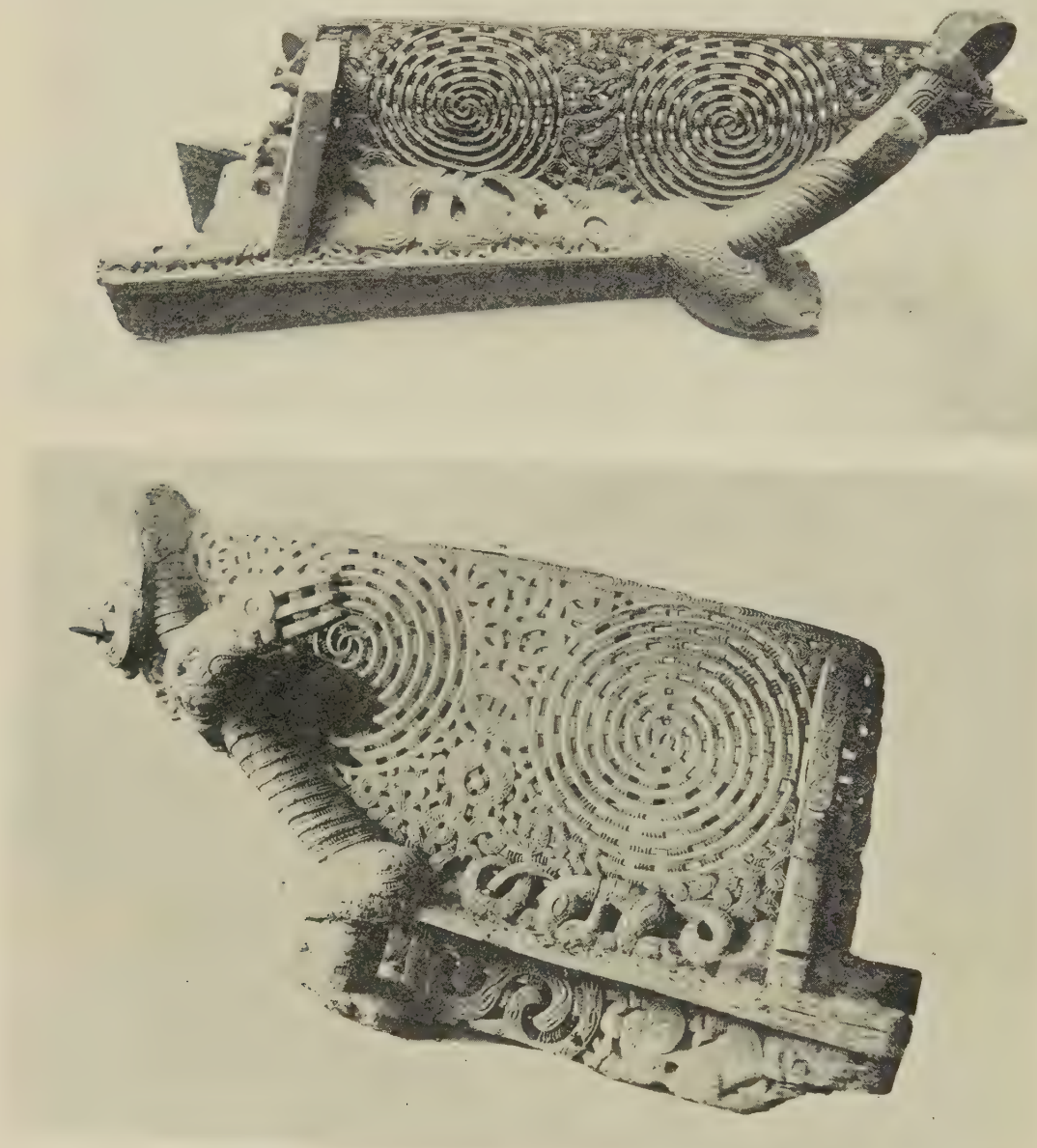
[*Photo, Dominion Museum Collection.*

FIG. 58.—TAUIHU, OR PROW ATTACHMENT OF WAR-CANOE.

In speaking of the ideality of the Maori of olden times Mr. Colenso remarks: "That faculty was exhibited in many ways—*e.g.*, in the building of their war-canoes, with all their carving and many adornments—and that without plan, pattern, or tools. The exquisite regularity and symmetry of both sides of the vessel, including even that difficult one of carved concentric circles worked in filagree, were astonishing; and, as such, borne ample testimony to by all their first visitors. . . For the carved figureheads of their canoes the *pukatea* was generally used, while the ornamental carved work of the sterns was made of *matai* or *totara*."

Of the carving of the stem and stern pieces Mr. Barstow says: "Only a small portion of the tracery must be cut out at a time, lest exposure to the sun should cause a crack. A fully ornamented stern-post was months, or years even, before it received its finishing-touch, though the pattern had been sketched from the first." This writer also remarks as follows on the custom of preserving carefully these valued carvings and transferring them to new canoes; "Sometimes, though the hull might be new, the

carved portions of worn-out canoes would be reused, being renovated for the occasion; formerly the stem and stern pieces were detached and stored in sheds when a war-canoe was laid up in ordinary."



[*Photos, Dominion Museum Collection.*

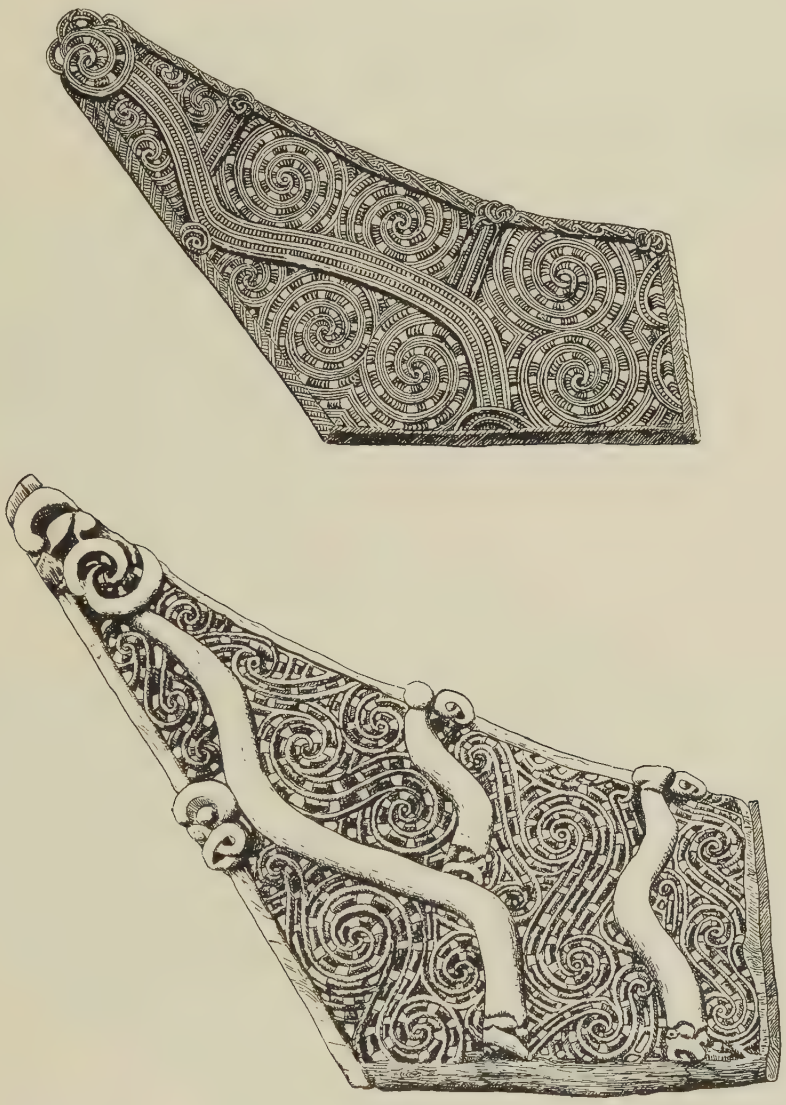
FIG. 59.—TWO TAUIHU—CARVED FIGUREHEADS OF WAKA TAUA, OR WAR-CANOE.

There are two different types of figureheads as used for the decoration of the superior type of Maori canoes. The most common is that shown in figs. 54, 55, 58, 59, 61, and 63; the other type is shown in figs. 60 and 62.

The first type is the true *pitau* form. Concerning these, the two most prominent features are the two large scroll designs, and the grotesque projecting figure with

protruding tongue and arms extended backwards. The detail work between the scrolls, and in other parts, is not precisely the same in all specimens, but the two leading features and the general form remain much the same.

In the other type of figurehead we have a different design. The projecting grotesque figure disappears, and the two large scrolls are replaced by a number of smaller ones or altogether disappear. In some cases curious compound scroll designs appear; also

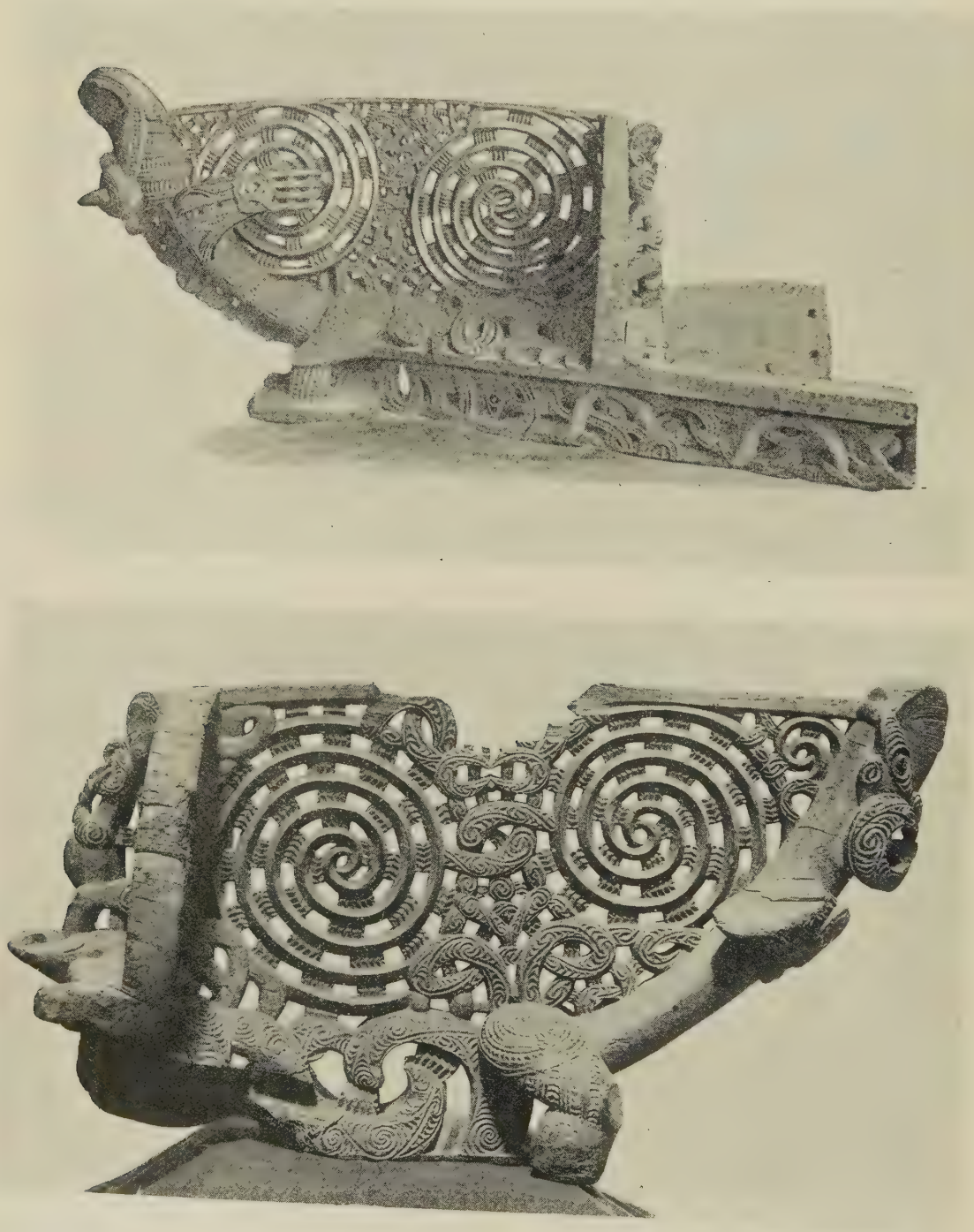


[*Sketches by Miss E. Richardson.*

FIG. 60.—TWO TAUIHU—CARVED FIGUREHEADS OF WAKA TAUA—NORTHERN TYPE.

the reverse scroll, approximating the letter S in form; also a more involved form resembling two such sets of reverse curves conjoined so as to coalesce. Professor Haddon, in his *Evolution in Art*, shows this reverse scroll on Pueblo pottery, and in Aegean art; also a design from the Necropolis of Thebes resembling the involved scroll design mentioned above. Another interesting feature in some figureheads of this type is the form imported to the strengthening-ribs that give stability to the design and counteract the

weakening effect of the filagree or pierced work. In some cases these ribs are of snake-like form and terminate in grotesque heads. The various illustrations and remarks thereon will draw attention to other peculiarities and details of these carved forms.



[*Photos, Dominion Museum Collection.*

FIG. 61.—TWO TAUIHU—CARVED FIGUREHEADS OF WAR-CANOES.

In some canoes a figure or head, grotesquely human, was carved on the underneath surface of the prow of a canoe that is, on the prow of the dugout hull. This

is seen on the "Mata-o-Turoa" canoe at Whanganui. Williams gives us three names for this figure—viz., *parata*, *toiere*, and *koneke*. Here, apparently, we see the origin of the term *waka toiere*, a canoe possessing this carving. Colenso's remark concerning the *parata* seems to refer to the prow of the dugout, not to the image carved on it: "*Parata* is also the name of that part of a war-canoe that projects out at the bow, beneath the image or figurehead, and meets the rising waves; near this was the coveted seat or stand of the hero or warrior chief." But a chief occupied a position at the stern of a canoe, not at the prow. Among the Tuhoe Tribe the carved head (only)

[*Photo, Dominion Museum Collection.*

FIG. 62.—NORTHERN FORM OF FIGUREHEAD, IN AUCKLAND MUSEUM.

placed on the gable of a house is called the *parata*, while a figure representing the whole human body so placed is called a *tekoteko*.

The plain type of figurehead affixed to second-class canoes is termed a *tete* (both vowels being long); the elaborately carved type we are now describing being known as a *tauihu;* while *pitau* describes the form in which scrolls appear.

It will be observed that the rear end of the figurehead is much reduced in height, and thus accommodates itself to the height or depth of the fore end of the top-strake,

to which it is attached by lashings when in position. In the series of illustrations published with the account of the voyage of the "Astrolabe" we note a different form, in which the projecting piece at the rear end is lacking, the high rear end of the figurehead butting against the forward end of the top-strake, above which it projects considerably. Not only so, but it also projects above a fore wash-strake, placed on the top of the full-length top-strake, or *rauawa*, and which extends nearly a quarter of the length of the canoe. To both of these strakes the figurehead is lashed, the join between the two strakes being covered with battens secured by lashings in the manner already described. It may be observed that all battens were rounded as to their outer sides in order to facilitate the tightening of the lashings. This fore wash-strake was not, apparently, universally used on *waka taua:* it seems to have been termed the *pairi. Williams's Dictionary* also gives *huhunu* as a name for temporary wash-boards at the bow of a canoe.

[*A. Hamilton, photo.*

Fig. 63.—A Fine Specimen of Carved Figurehead in Christchurch Museum.

Length, 6 ft. 3 in.—an unusually long specimen.

In the Auckland Museum is part of a canoe-prow showing in its interior hollow parts a fine example of chipping with stone adzes.

A study of the carved canoe-prows of the New Guinea and Indonesian areas would probably show a resemblance between some western forms and those of New Zealand. A striking form of the former area is depicted at page 50 of Hornell's *Outrigger Canoes of Indonesia.*

The Taurapa, or Stern-piece.

The ornamental stern-piece (*rapa* and *taurapa*) of a first-class canoe was an object on which much time and labour were spent, as will be seen by referring to the illustrations. The elaborately carved specimens were highly prized, and it will be seen that

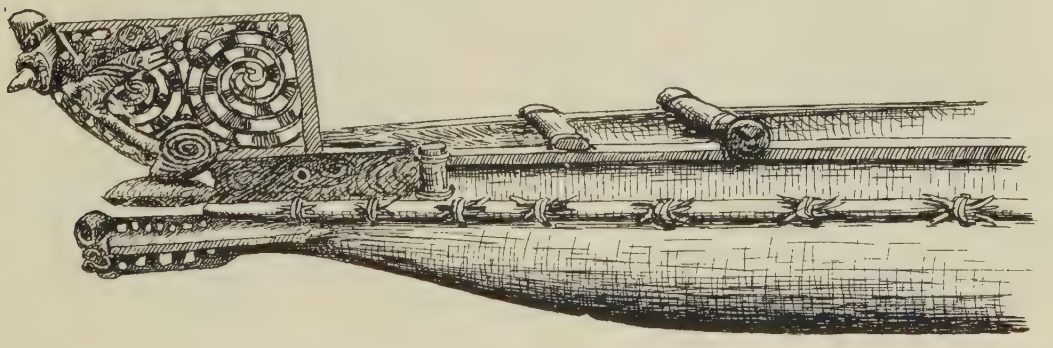
there is but little variation in the form of these objects. As the pierced work of the carver much affected the strength of the plank, strength was imparted to it by the curved ribs that form so prominent a feature. In most cases the spaces on either side

[*Photo, Dominion Museum Collection.*

FIG. 64.—FIGUREHEAD AND STERN-PIECE OF A MODEL CANOE IN THE DOMINION MUSEUM.

of these ribs are seen to be occupied by a series of scrolls, between which various minor designs are seen.

The *taurapa*, or stern-piece of a canoe, is set up on the hull and attached thereto and to the square-cut ends of the top-strakes in the same manner as the figurehead is. In an elaborate canoe feathers enter largely into the ornamentation of the stern-piece.



[*Sketch by Miss E. Richardson.*

FIG. 65.—PROW OF A MODEL CANOE IN NAPIER MUSEUM.

Showing an abnormal feature in the horizontal projection under the *tauihu*.

The feather ornament at the top is termed the *puhi ariki*, or *puhi kai ariki*. The two long streamers or tails of feathers are the *puhi moana ariki;* the former pertains to the gods of the winds, the latter to the sea-gods, who are the guardians of the vessel. The latter often trailed in the water during the passage of the craft. In some cases feathers

were attached to the lower part of the *taurapa*. The term *puhi rere* is sometimes applied to the streamers. Similar decorations were employed at the Society Isles.

In an account of the "Takitumu" canoe given by Wi Pere to Tuta Nihoniho the following remarks concerning the decoration of the stern-piece occur: "The upper *puhi* was fixed as a resting-place for the gods of the heavens, and named Puhi-ariki. The *puhi* at the base of the *taurapa*, touching the water, was arranged as a clinging-place for the gods of the ocean, and named Puhi-moana-ariki."

Fig. 66.—Two Carved Stern-pieces of Waka Taua.

The upper feather appendages, as seen on the "Heke-rangatira" canoe, in the Dominion Museum, are secured to a small upright rod lashed to the upper part of the stern-piece.

The scrolls seen in the carved designs are termed *pitau*. In some cases the *koruru* design was employed by carvers of *rapa*, showing human heads on both sides.

Feathers of the pigeon (*kereru*) were employed in the adorning of these stern-pieces.

Polack, when at Uawa in 1835, employed a native to carve for him a *rapa*, or canoe stern-piece. When finished the carver presented his bill, which consisted of six small pieces of wood tied together with a piece of flax, which represented six "heads" of tobacco (less than ½ lb.)—the contract price.

In the illustrations to *D'Urville's Voyage* appear three stern-pieces ornamented with feathers. On one of these such adornment is limited to a single tuft at the summit of the *taurapa* and a fringe round its base. In another case a fringe of feathers extends

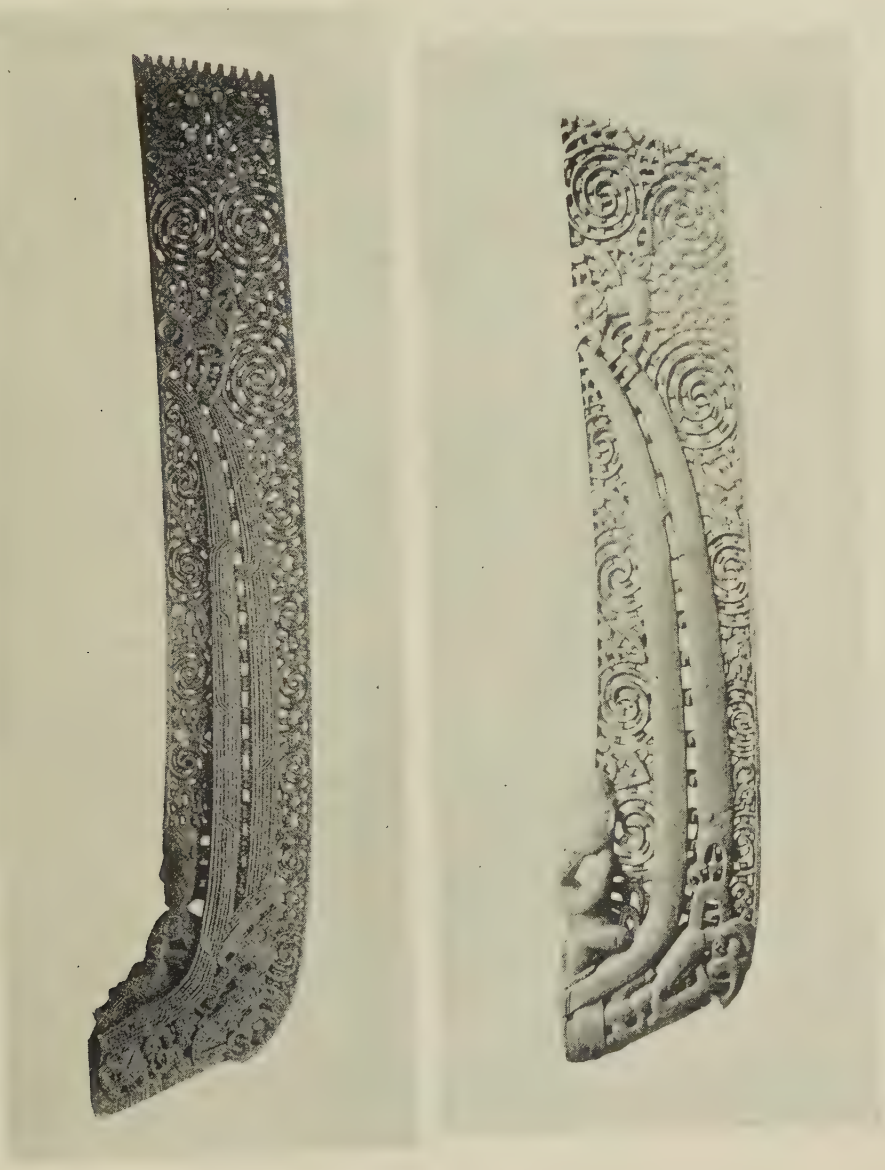


Fig. 67.—Two Carved Stern-pieces of Waka Taua

along the top and all the way down the outer edge of the stern-piece to its base. A third stern-piece is depicted as being extremely narrow, of amazing height, and entirely covered with feathers so that no portion of the wood is visible. A few short streamers appear on the latter, but no long ones on any of the three. There is an element of doubt as to whether these adornments are correctly represented. In no case is the join of stern-piece and hull plainly shown.

Early writers speak of these stern-pieces as being in some cases from 12 ft. to 18 ft. in height. I much doubt the former use of such high ones as 3 fathoms.

Another old print (taken from Cook) shows a highly carved stern-piece having a fringe of feathers across the top and right down its frontal or forward edge, as also two long streamers suspended from the rear of its upper part. This is probably a more correct representation of these ornaments. This appears in *Hawkesworth's Voyages* (1773, vol. 3). The same plate shows a prow-piece adorned with feathers along its upper part.

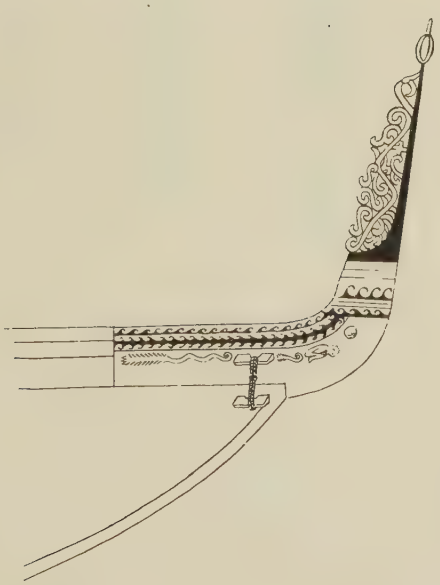
[*H. Hamilton, photo.*

FIG. 68.—STERN-PIECE OF WAR-CANOE DEPICTED IN COOK'S VOYAGES.

From vol. 3 of Hawkesworth edition.

It has been generally held that the designs of Maori wood-carving, as apart from such representations as that of the human form, represent a local development. The occurrence of similar designs elsewhere, however, cause one to ask if many of these peculiar designs have not been introduced, though possibly elaborated here. It is to the

FIG. 69.—BASAL PART OF STERN-PIECE OF THE "TOKI-A-TAPIRI" CANOE, IN AUCKLAND MUSEUM.



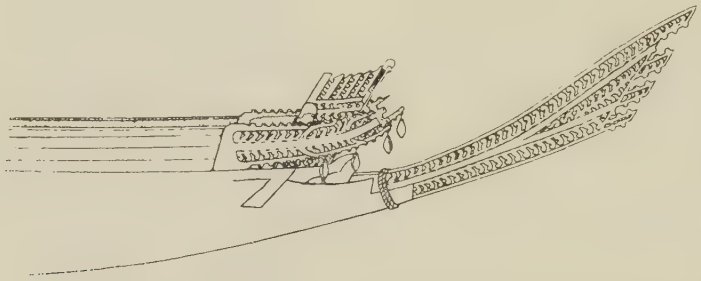
[*Sketch by Miss E. Richardson*

FIG. 70.—DECORATED PROW OF A LARGE MANOKWARI OUTRIGGER (NEW GUINEA AREA).

Compare with Maori stern-piece. (From Hornell's *Outrigger Canoes of Indonesia;* by permission of author.)

western Pacific that we must look for such parallels or resemblances. A crude form of the double *manaia* design is seen in Melanesia, while certain decorative designs of Dutch New Guinea closely resemble Maori curvilinear designs.

In fig. 9 of Hornell's *Outrigger Canoes of Indonesia* we see a form that might well be the prototype of our Maori *taurapa*. (See also *Journal of the Polynesian Society*, vol. 32, fig. 13, p. 76.) The resemblance is very striking, even to the sinuate median rib



[*Sketch by Miss E. Richardson.*

FIG. 71.—DECORATED PROW OF LARGE OUTRIGGER, WOOI BAY, NEW GUINEA AREA.

(From Hornell's *Outrigger Canoes of Indonesia;* by permission of the author.)

that gives strength to the perforated scroll work. (See fig. 70, p. 105.) In plate viii, fig. 14, the above writer shows another striking form, pertaining to canoes of Sulu. This bifid form reappears in an illustration of a Samoan canoe at page 266 of Turner's *Nineteen Years in Polynesia* (1861).

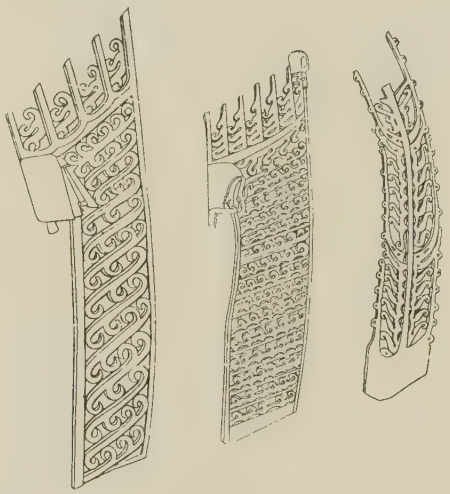


FIG 72.—PROW-ORNAMENTS OF CANOES OF NEW GUINEA AREA.

(From a paper by Jas. Hornell on decorative work of canoes of New Guinea, published in the *Journal of the Polynesian Society*, vol. 32; by permission of the author.)

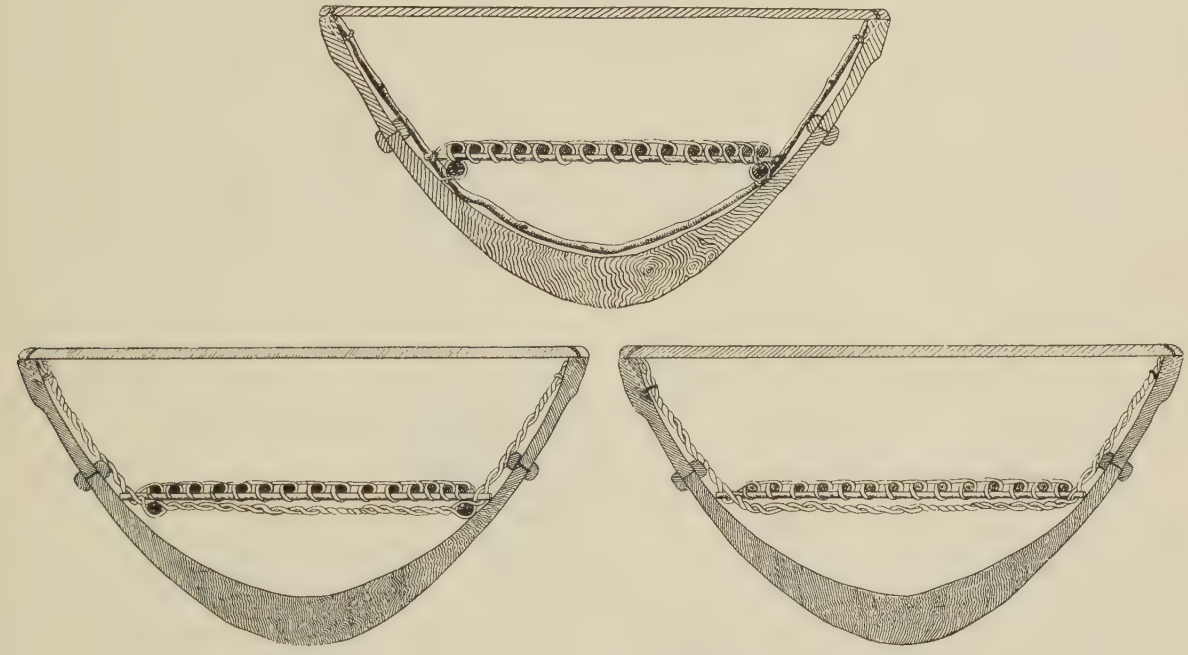
In *Du Clesmeur's Journal* (1772) the writer tells us that he measured Maori pirogues that were 70 ft. in length by 8 ft. in width, and made out of a single piece of timber. He states the height of the *taurapa* as about 12 ft. So far as I am aware, no specimens of these extremely lofty *taurapa* have been preserved.

THE FLOORING OR DECKING.

The floor-like platform in a canoe can scarcely be termed a deck, for it was considerably below the level of the thwarts, and was but a rude grating. The floor itself was composed of small straight rods of about 1 in. diameter laid longitudinally in

the canoe and supported by cross-pieces (*pae*). There seem to be three different methods of supporting the floor, or *karaho*, as it was termed, of which name *raho* and *rahoraho* are variant forms. In the east coast method described below a pliable *aka* (vine) is employed as a free or false rib, extending up both sides of the canoe. (See fig. 73.) Another method is to use two straight rods, one on either side of the hull, to support the cross-pieces. (See fig. 74, A, p. 108.) Yet another mode is seen in the case of the "Heke-rangatira" canoe, in the Dominion Museum, in which the cross-pieces supporting the floor, though resting at either end on the sides of the canoe, are also suspended at either end from the thwarts by several ply of small but tough and pliant *aka* (stems of climbing-plants). This latter method may not be an old usage, however, and the manner of the attachment to the thwart-lashings looks doubtful.

The first of these methods may be described as follows: The flooring or decking of a canoe is supported by the *tokai*. These are stout pieces of tough, durable *aka*, one end of which is inserted under one end of the thwart; then the pliant stem is bent downwards so as to assume the form of the hold of the canoe, against which it is



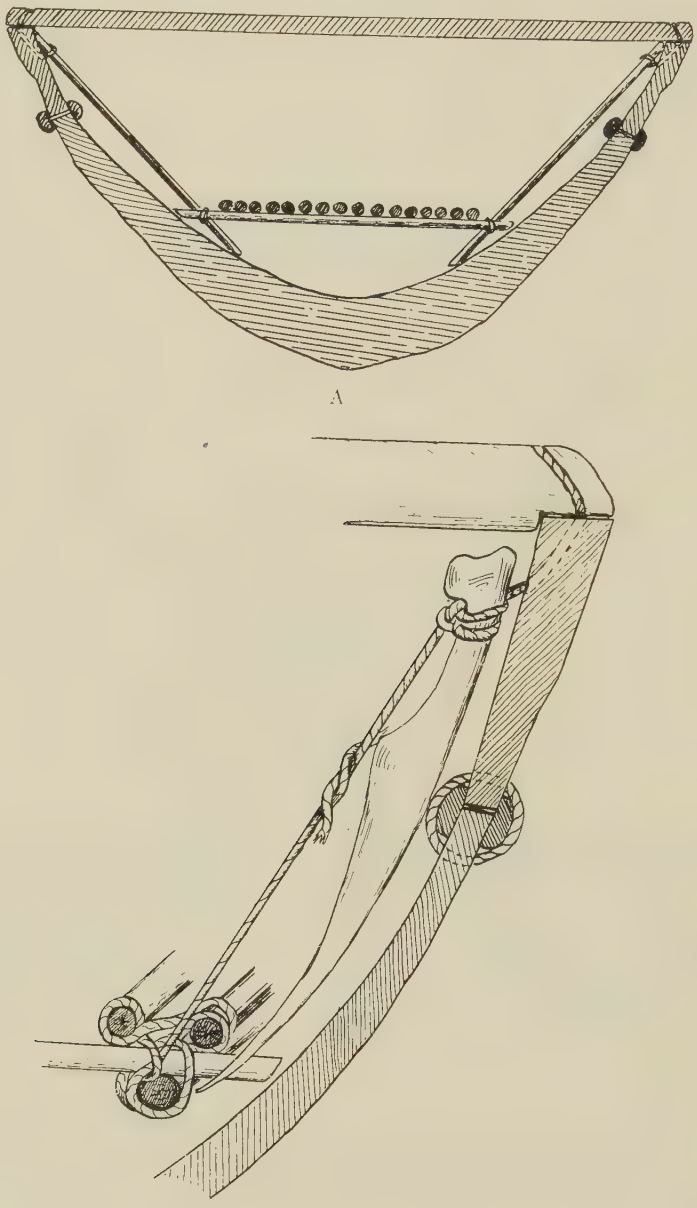
[*Sketches by Miss E. Richardson.*

FIG. 73.—DIAGRAMS SHOWING THREE METHODS OF SUPPORTING THE FLOOR-GRATING OF A CANOE.

pressed; the other end of the piece is slipped under the other end of the thwart. Both ends are confined by lashing them with the ends of the cords that secure the thwarts. As this bent piece passes over the two battens that cover the inside of the join of top-strake and hull, it follows that just above such battens small open spaces occur between the *tokai* and the side of the canoe. Now, when a man is not using his paddle he thrusts the end of the blade into that space or crevice, and rests the hand-grip end on the thwart; thus his paddle is out of the way and secure.

The next item in the construction of the flooring is the securing of battens or rods, known as *kauhuahua*, in a horizontal position to the *tokai* by the universal means of lashing. Thus these fore-and-aft battens rest on the *tokai;* and pieces of timber (*pae*) are then laid across the canoe from side to side, resting on the battens, to which they are tied. (See upper design in fig. 73.) Then long, thin, straight rods, often of *manuka* (*Leptospermum scoparium*), are laid on these cross-pieces close together, fore and aft of

the canoe, and tied to them. Here, then, is your floor. In large, important vessels, such as war-canoes, two openings are left in the floor as places whereat to bail out the vessel, such places being termed *puna wai* or *taingawai*. (In fig. 75, A, one such is shown.) Ngati-Porou folk seem to apply the name of *taingariu* to these bailing-places,



[*Sketches by Miss E. Richardson.*

FIG. 74.—FLOOR-GRATING AND DECKING.

A. A common method of supporting the floor-grating of a canoe (see p. 107). In another method the fore-and-aft *kauhuruhua* were lashed to the *tokai*, and the cross-pieces to support the flooring were then lashed on to these stringpieces.

B. Diagram of a method of suspending the decking of a canoe as recorded by the late A. Hamilton. The author has no data concerning the possible use of this method by the Maori.

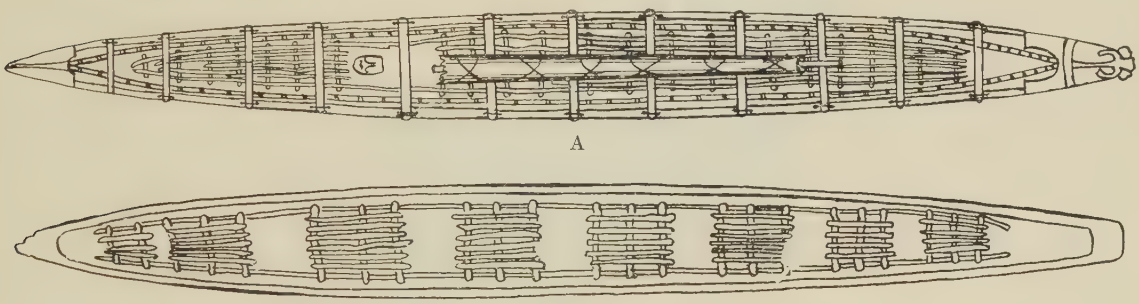
though our informant thinks that this term properly applies to one only, the one nearest the stern at the deepest part of the hold. The cross-pieces are numerous, as they serve as floor-joists.

In fishing-canoes an open space was, in some cases, left in the flooring between each two thwarts, and in each of these open spaces was fixed a net into which the fisherman put his catch. This net was secured to a hoop supported by short vertical rods, and hung down into the hold like a bag. (See fig. 82, p. 123.)

The above notes on the construction of the flooring were supplied by Tuta Nihoniho, of the Ngati-Porou Tribe of the east coast.

In the other method a short straight rod called a *tokai* is placed against the inner side of the canoe on each side, as shown in fig. 74, A, at p. 108. The longitudinal supports (termed *kauhua*, *kauhuahua*, and *whakawahine* in *Williams's Maori Dictionary*) for the cross-pieces are lashed to the uprights (*tokai*), and on them rest the cross-pieces (*pae*) that support the flooring or platform of rods. The cross-pieces, being lashed to the lower parts of the uprights, tend to keep the latter in position. The rods forming the platform are also lashed to the cross-pieces. Fig, 74, A, illustrates a method in which the *kauhua* was dispensed with.

In no case are the cross-pieces of the flooring allowed to rest on the inside battens of the *rauawa*, for obvious reasons. Anything that put undue strain on the lashings of a canoe was ever guarded against, not so much on account of a fear of breakage as the fact that all fibres so used are liable to stretch under such usage, and thus cause a harmful slackness in lashings, and looseness in the parts lashed together. For it must



A

B

[*Sketches from "D'Urville's Voyages," by Miss E. Richardson.*

FIG. 75.—CANOE INTERIORS.

A, showing interior of canoe, floor-grating, bailing-well, and furled sail stowed on thwarts.
B, showing floor-grating of a fishing-canoe, with spaces for nets to contain fish.

ever be remembered that the stability of the vessel, and the cohesiveness of its parts, depended upon the lashings, which were equivalent to the bolts, rivets, metal stays and braces, spikes and nails, &c., used in the construction of our ships.

Wakefield seems to have seen the pliant stems of supplejack (*Rhipogonum scandens*) employed in making flooring-platforms in canoes on the Whanganui River: "In the large canoes a wattled floor made of *kareao* (supplejack) is raised level with the junction of the body of the canoe and the topsides; and on this the passengers sit. A square hole amidships is left for the use of the bailing-spoon. This is rather a graceful implement, being often handsomely carved. It somewhat resembles the small shovel used to take coals out of a scuttle, with the handle turned forward over its upper side." (See figs. 122 to 127.)

The flooring-platform of a canoe is placed a little below the level of the junction of the hull and top-strakes, thus giving access to the lashings. In voyages the floor was often covered with rush mats, on which people reclined. In some cases a covering of bracken, or *mingi*, was so used, over which mats were spread.

Small canoes had no flooring or decking in them, and canoes with no top boards were not fitted with thwarts. Spare cordage and caulking-material were carried on voyages in case of need, as if a thwart worked loose or some caulking needed renewing.

The hole made in the bottom of the canoe to let the water run out when hauled ashore was situated in the middle or a little forward of the middle of the vessel. It was closed with a wooden plug. When a canoe was hauled up on the beach stern first, the water in the hold, running forward, escaped by the hole. This is said to be the east coast usage.

Williams gives *kaiwae* as another name for the flooring-platform of a canoe, and *karemu* as the plug employed to block the *kowhao*, or hole in the keel.

The Painting of a Waka Taua.

Nothing now remains to do to finish our craft but to paint it. The favoured colour was red, which was used for most parts, though the battens covering the join of hull and top-strakes were painted black, as a contrast to the red sides. On these the bunches of white feathers placed under the lashings were most effective. The *puhoro* design under the bow was often executed in black and white. The prow and stern pieces were usually painted red, but in the north were sometimes blackened.

[*W. R. Reynolds, photo.*

Fig. 76.—Tauihu in Auckland Museum, showing somewhat crudely painted Design under Prow.

(See also fig. 13, p. 33.)

In the following passage Mr. John White appears to show that the top-strakes were sometimes embellished with painted patterns in place of carved designs: "When the side-boards of a canoe were about to be marked with patterns in *kokowai*, the ground is first washed or wetted with the expressed sap of the *poporo*. That is said to have caused the paint to adhere well to the surface of the timber, and also enhanced its colour."

Mr. Barstow writes as follows on canoe-painting: "The next process is to paint our vessel; and for the prevailing red colour in fashion, *karamea*, a species of clay, which needs to be burnt before being applied, is most valued. The parts to be coloured are first cleaned, then sized with juice of sowthistles and the *poporo* shrub, after which the *karamea*, mixed with water, is rubbed on; this yields the most brilliant colour, and is very lasting. *Kokowai* is a kind of pigment burnt, dried, and mixed with shark-liver oil. This is a good deal darker than the former. The batten, carved stern, and head of a *waka taua* are usually blackened with powdered charcoal or lampblack and oil. The *waka tete* has usually a red head. On gala occasions the *taka*, or outer batten, would be adorned with albatross-feathers, and wreaths of pigeon or wild-duck feathers flutter upon the stem and stern."

The *poporo* shrub mentioned is *Solanum aviculare*. It was the custom to mix the ochre with oil, not with water, as above stated. *Karamea* and *takou* are names of ochreous earths that were burned before use; *kokowai* and *horu* are names of an ochreous sediment deposited by certain streams. This sediment was collected, formed into balls, and dried at a fire, then put away for future use.

In his account of the preparation and use of *kokowai*, or red ochre, Archdeacon Walsh remarks: "When used for the painting of a war-canoe it was relieved with black, and occasionally with white. Thus, the hull and topsides were invariably red and the figure-head and stern-post, as well as the long batten which covered the joint between the hull and topsides, were usually a lustrous black, while for several feet under the bows a running pattern was painted in black and white, suggestive of the rippling of waves. The effect of this combination was most striking and beautiful, especially when the head and stern pieces were further decorated with their ornament of parrot and pigeon feathers, and the covering batten spaced at intervals with the white plumes of the gannet."

The Archdeacon gained his knowledge of Maori life in the north, hence his remark that the prow and stern pieces were usually black; in other districts they were usually red. Hare Hongi, a native of the north, however, tells us in the following communication that red paint was more commonly employed in that district:—

Note on Blackened Canoe Prow and Stern Posts.—If it were so desired to have the new *tauihu* and *taurapa* blackened, instead of being coloured with the *kokowai*, as was more usual, a *hinau* dye was prepared by pounding the bark and steeping it in a wooden vessel containing water, which was brought to a boil by means of red-hot stones. The carved *tauihu* and *rapa* were steeped in the dye thus prepared —for two nights usually. They were then removed to a swamp containing an abundance of sediment, or *parapara*, and flung into it, where they were left for one night usually. Removed from the swamp as they dried, they were smeared with *hinu* (oil or grease), and they then remained a permanent and approved black colour. Designs in black were frequently made in the body of the canoe itself. When, owing to various circumstances, it was not convenient to use the *hinau* dye, the articles were simply plunged into a swamp containing an abundance of sediment (*parapara*), and left to steep for three nights, then taken out and smeared with oil. Thus darkened, the colour, though permanent, was not so much approved. Of one process we say "*He mea tuku ki te parapara*"; of the other we say "*He mea pani ki te kokowai.*"

30th March, 1906. HARE HONGI.

Here it is seen that paint was not employed in the north for blackening these carvings, but that they were stained by means of sinking them in swamp-mud. The steeped bark of the *hinau* (*Eleocarpus dentatus*) produces a dye that does not blacken an object immersed in it, but turns it a brown colour. It is said to act as a mordant, and also to intensify the black stain produced by the swamp-mud in which it is afterwards placed. The Maori weaver of garments dyed fibres black by the same process, which is described by Te Rangi-hiroa in *Dominion Museum Bulletin No. 3* (at p. 75).

The following note, contributed by Tuta Nihoniho, serves to explain why charring and staining were resorted to as blackening-agents: Black paint, made by mixing oil and powdered charcoal, was sometimes used wherewith to paint the battens of a canoe; but the appearance thereof was soon sadly marred by the salt water, hence the charring of such slats while yet green, whereby they retained a desirable degree of blackness.

In painting the body of a canoe or any such surface a brush was used consisting of some tow of *Phormium* fibre tied to a stick; but in finer work, such as painting sketched patterns and fine carvings, a feather was used as a brush—a stiff tail-feather from which the web was stripped save at the extremity.

The following notes on painting-materials were also contributed by Tuta: The substances formerly used as painting-materials in the adorning of houses, canoes, &c., were *horu*, *takou*, *ngarehu* (charcoal), *poroporo*, and *taioma* (pipeclay). The sap of the *poroporo* (*Solanum*) was expressed and used apparently as a sizing on woodwork prior to painting. The *horu* (red ochre obtained from water) and *takou* (ochre obtained by burning earth)

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Arizona State Museum

and charcoal were pulverized and mixed with *hinu mango*, or shark-oil. Soot obtained by burning *mapara*, the resinous wood of *Podocarpus dacrydioides* (*kahikatea*), was mixed with the same oil and used as a black paint. The white *taioma*, or pipeclay, was burned, then pulverized and mixed with oil, and used as a white paint.

The manuscript notes of the late Mr. John White furnish the following corroboratory notes: Powdered charcoal was generally used in the manufacture of black paint. It was mixed with shark-oil and sap expressed from leaves of the *poporo*, a *Solanum*. The latter ingredient is said to have caused the paint to adhere well to woodwork, to prevent it fading, &c. The sap of the *poporo*, if used alone, makes a green stain. The best quality of black paint was made from soot obtained from burning the resinous wood termed *mapara* and *kapara*. To obtain this soot (*awe kapara*) a small erection was formed of sticks stuck in the ground in the form of a bell tent. This was covered in with a woven flax mat, leaving a small opening at the top, and inside was kindled a small fire of *kapara*. Bundles of narrow strips of flax-leaf were suspended at the upper part of the cone in order to arrest the soot.

Nicholas, who sojourned in New Zealand in 1815, wrote as follows: "Widoua [? Wairua] set about painting the gunwales [of the canoe] with red ochre mixed up in oil. The instrument he used for a brush was a tuft of feathers; and he laid on the composition very dexterously."

One native authority states that, when painted, the surfaces of the canoe received a final dressing of shark-oil, which helped to preserve the paint, and also is said to have had some effect in causing the vessel to travel better through the water.

Polack, a trader of the "thirties" of last century, remarked that in some case canoes were adorned with painted designs only.

Launching.

The launching of a first-class canoe was an important function in Maoriland; it called for certain ritual observances, and was followed by a ceremonial feast. Like many other native functions, it was also an important social meeting, whereat would assemble many scattered social units and tribal divisions. Such meetings were much enjoyed by Maori folk, and were the occasion of much feasting and indulgence in many forms of amusement, dancing, singing, and the playing of games. Many of the latter come under the heading of exercises. At such meeting also were discussed all matters pertaining to the welfare and activities of the tribe and its various divisions.

A priestly adept (*tohunga*) chanted certain ritual over the new vessel, and this appears to have been a placing of the craft under the care of the gods. In some cases a human sacrifice seems to have been made, though it does not appear to have been a common practice. The killing of a slave or enemy as food for the feast is a different thing from a sacrifice for ritual purposes. *Williams's Maori Dictionary* gives "*Taitai*—to remove *tapu* from a new canoe, a ceremony accompanied with the slaughter of a slave." The term *koangaumu waka* has a similar meaning.

The following welcome to the new canoe was chanted by the people in some cases: "*Naumai, e Tane! Ka kau taua i te awa o Pikopiko-i-whiti; kia matakitakihia koe e te tini o te tangata. Naku koe i tiki atu ki te wao nui a Tane.*" ("Come hither, O Tane! Let us go forth on the waters of Pikopiko-i-whiti that you may be observed by all persons. 'Twas I who went and brought you hither from the great forest of Tane.") Here we see that the canoe is addressed as Tane: it represents the forest of which Tane was the origin. Pikopiko-i-whiti is said to be the name of an expanse of water surrounding the island of Hawaiki, from which the ancestors of the Maori came to New Zealand, and outside which sheet of water was a line or reef of rocks separating it from the ocean.

The expression *whakainu waka* was applied to the launching of a new canoe, and certain ritual repeated at the time is said to have been known as *whakainu*. This ritual was distinct from the *kawa*, which was recited prior to the launching.

The following notes on the *kawa* and kindred subjects were supplied by Tuta Nihoniho :—

The *kawa* rite was performed over a new canoe of importance, such as a war-canoe, but not over an ordinary fishing-canoe. This curious ceremony took place prior to the launching of the completed vessel, and if correctly rendered, without any mistake or mishap, then such a fact was accepted as a good omen for the future of the canoe—it would be a lucky, safe, and successful vessel. Should, however, any error be committed during such performance, then assuredly the craft would be an unlucky one, and some mishap to it, or in connection with it, would certainly come to pass.

On the day previous to the *kawanga* the *tohunga* (priestly adept) would enter the forest and seek therein a small shrub of *karangu* (*Coprosma*), about 3 ft. in height. Having found such a plant, he laid his hands upon its leaves, and repeated the following words in order to render the shrub *tapu* for the purpose it was to serve :—

Tohungia te tohu o te mate
Tohungia te tohu o te ora

thus endowing it with the power whereby to foreshadow the welfare or otherwise of the new vessel. He then returned home.

On the following morning he again proceeded to the shrub, and, grasping the stem thereof, repeated the following :—

Tohungia te tohu o te mate
Tohungia te tohu o te ora
He unuhanga a nuku, he unuhanga a rangi
Ka unu to peke mua, ka unu to peke roto
Ka unu to peke taha, ka unu to peke marie.

He then pulled the shrub up by the roots, and, should the roots thereof be drawn out of the earth in their entirety, without breakage, he remarked "*Turuki ki tahito o te rangi.*" If the roots, or some of them, snapped off as he pulled the shrub up he cried "*E taukuri E! He atua, he taitahae.*" This latter expression is equal to "Alas! There's the devil to pay." For the omen drawn from the broken roots was a bad one, presaging misfortune for the canoe and its owners. Hence the operator would at once go and consult other priestly or shamanistic experts, and obtain their assistance in order to *kaupare*, or avert, the evil omen, or to *huri* (overthrow) it—that is to say, to remove or abolish the ill omen by means of invocations or charms.

Now, this curious act of divination in pulling up the shrub obtained its *mana* (power, effectiveness) from the fact that it had been made *tapu* for the purpose, as explained above. To pull up any other, non-sanctified shrub for such a purpose would be idle and useless, from the Maori point of view.

During the performance of the *kawa* rite the *karangu* shrub was dipped in the water by the officiating *tohunga*, and struck on the *tauihu*, or figurehead, of the canoe. This is done at a certain stage in the repetition of the invocation of the *kawa;* at another stage the name of the canoe is repeated. In this curious ceremony the *tapu* is lifted from the vessel. It was constructed under *tapu* so that the task might be brought to a satisfactory conclusion; it now being so finished, the *tapu* is taken off. The essential object of the *kawa* rite is to abolish the power and influence of the previous sacred ritual performed over the canoe, so that it is no longer dangerous, that it may be approached and handled by non-*tapu* persons—in short, that it may be used. During the *hurihanga takapau*, or *tapu*-lifting ceremony, the officiating *ruahine*, or priestess assistant, gets into the canoe. The inferior female element, with its polluting qualities, has now come into contact with the *tapu* vessel: the *tapu* is destroyed; the canoe is

noa. After this it would be permissible for a woman to stand in the canoe and act as a *kaea*, or fugleman, in the rendering of a hauling-song.

After the canoe was launched, and had been paddled by a crew on a trial trip, a great feast was held, for which the materials had been long preparing—crops grown and preserved foods stored. To this ceremonial feast other clans were invited, and perhaps a human sacrifice made. A man of some other tribe would be slain for this purpose, his heart offered to the gods to induce them to rest or light upon the canoe—*i.e.*, to protect it and its occupants—and the rest of the body was cooked and eaten as a special dish at the feast. The offering of the human heart was to the tribal gods. The act of dipping a shrub or green branch in water, and then touching the *tapu* canoe, house, or child with it, was to ensure the protection and assistance of the gods.

The quaint old ritual chanted at the ceremony known as the *kawa*, or *kawanga*, as contributed by Tuta, has already been published in the *Journal of the Polynesian Society*, (vol. 171, pp. 96–98). It is of interest only to Maori linguists, and translations of such old matter are always doubtful.

A person slain at the *kawanga* of a canoe was a sacrifice to the gods, and the idea behind it was to secure the protection and assistance of such gods, which meant general good luck for the vessel, and the assistance of sea *taniwha* (monsters) in any crisis.

Te Whatahoro, of Wai-rarapa, contributes the following: Occasionally a human sacrifice was made at the completion of a high-class canoe, such as a war-canoe. In such cases, when the canoe was finished and launched, a leading person, probably the chief owner of the vessel, would ask "*Ko wai he tangata mo to tatou waka?*" ("Who shall be a person for our canoe?"). Then it is not improbable that some person, perhaps an old relative of the chief, would say "*Ko au*" ("Myself"), whereupon he would be slain, his heart taken out and offered to the gods at the *tuahu*, or sacred place, after which it would be taken to the latrine and there left. It being deposited at that place would do away with any possibility of it being eaten by any person. The body, being that of a relative, was not eaten, but was placed in a steam-oven in the earth and left there for all time. If the slaying of the voluntary sacrifice was not approved of by the leading men, then a *karearea* (sparrow-hawk) was obtained and its heart so offered to the gods. It would be deemed a most unlucky act to slay as a sacrifice for such a function any person who had not consented to be so served—that is, who had not so volunteered for the purpose.

This singular custom is said to have been introduced from Hawaiki, the former home of the Maori people. Human sacrifice at the launching of a new canoe was not a custom on the east coast, and nothing is known there of any new canoe having been launched over the bodies of slaves used as skids.

A sacrifice of six birds was made when the "Takitumu" canoe was launched. The object of such sacrifice was to induce the gods to cherish and protect the vessel.

Tuta contributed the following additional notes: The term *taitai waka*, or *koanga-umu waka*, was an expression applied to some special food obtained for the ceremonial feast held on the completion of a high-class canoe. Such food might be human flesh, dog's flesh, rats, or birds.

Any such items used as offerings, or in a sacerdotal manner, as for a ceremonial feast, were termed *marere*. The expressions *pure* and *whaiwhainga kai* might also be applied to them. The modern term for such is *patunga tapu*, but this phrase was so applied by missionaries.

When a new canoe was first used for fishing, one fish of the first haul was set aside as an offering to the gods. Also, when a new canoe was first used on a war expedition, the first man slain was utilized as a sacred offering to the gods.

On a war expedition no cooked food could be carried in a canoe, nor could a fire be kindled on board.

Large-sized Canoes.

A number of early writers have recorded notes on the larger canoes seen by them on these coasts, some of which are here reproduced.

Sir Joseph Banks, who accompanied Captain Cook on his first voyage, writes as follows of a canoe seen on the east coast in 1769: "On an island called Jubolai [?] we saw the largest canoe which we had met with; her length was 68½ feet, her breadth 5 feet, and her height 3 feet 6 inches. She was built with sharp bottom, made in three pieces of trunks of trees hollowed out, the middlemost of which was much longer than either of the other two; their gunnel planks were in one piece 62 feet 2 inches in length, carved prettily enough in bas-relief; the head also was richly carved in their fashion."

This was a canoe with a *haumi* at each end. The sharp bottom is an uncommon feature of the Maori canoe as known to us, save at the two ends.

When in the eastern part of the Bay of Plenty, on the 31st October, 1769, Cook saw a larger canoe: "No less than five canoes came off, in which were more than forty men. . . Another, of an immense size, the largest we had yet seen, crowded with people, who were also armed, put off from the shore, and came up at a great rate . . . we could see that it had sixteen paddles on a side, besides people that sat, and others that stood in a row from stem to stern, being in all about sixty men."

At a point on the eastern coast of the northern peninsula seven large canoes, containing about two hundred men, went off to Cook's vessel. Again, at the Bay of Islands, "several very large canoes came off to us, full of people."

Parkinson speaks of a canoe seen at the Bay of Islands that "had eighty people in her, most of whom paddled."

A canoe seen at the Bay of Islands by Marion's crew, in 1772, contained from eighty to one hundred natives. It was ornamented with fine carvings. Another seen was 67 ft. in length and 6 ft. 4 in. wide, made out of a single log. It was handsomely carved, and went at a fine speed. Another is mentioned as being a superb canoe, 70 ft. in length, and made all in one piece. In Du Clesmeur's journal of Marion's voyage, published in volume 2 of McNab's *Historical Records of New Zealand*, occur the following remarks: "These people are by no means ignorant of the art of seamanship. They have indeed carried it to perfection, relatively to their needs. Their pirogues, or canoes, are of great beauty. I have measured some that were 70 ft. in length by 8 ft. in width, and made out of a single piece of timber. They are sharp at each end, and the keel is hewn out in such a way as to insure a good speed. They travel at a very rapid rate. We have seen no sails in any of them, very light paddles being used. There are usually about forty men in each canoe. The stern and the prow are ornamented with two pieces of carving; that on the stern is about 12 ft. in height and 2½ in. in width [thickness]. It is openworked, and painted red like the canoe itself. Above this board is a sort of plume of black feathers. The ornament of the prow is not more than 2 ft. in height, and on the top also are feathers. The tools they use for building are made in the same style as those of the natives of Tahiti. It is a sort of adze made of touchstone, fitted on to a bent piece of wood. Others of their tools are made of a green stone which is transparent, and of which they make tools for their carvers."

An interesting feature of these measurements is the fact of variation in the width of canoes in proportion to their length. A craft 68 ft. long was 5 ft. wide; another 67 ft. long was 6⅓ ft. wide; another 70 ft. long and 8 ft. wide; another 60 ft. long and 4½ ft. wide; another 84 ft. long and 6 ft. wide. The big canoe in the Auckland Museum is 83 ft. long and 5 ft. 8 in. wide between the top-strakes. Another in the Dominion Museum is 42 ft. long and 4 ft. wide between top-strakes. These width-measurements are those of the widest part.

Nicholas, writing in 1815, remarks: "Hongi . . . came in a very handsome war-canoe, tastefully ornamented with rich carving at the head and stern. . . This canoe was by much the largest of any I had yet been in, measuring sixty feet in length by four feet six inches in breadth: and at about the distance of a foot from the bottom was fixed some wickerwork, which, running along the whole length of the canoe, served for an easy and commodious seat."

In 1815 Kendall saw at the Bay of Islands a canoe 87 ft. long that was manned by sixty-seven men. It was one of a fleet of fourteen.

In his journal of 1819 Marsden mentions seeing one of the Bay of Islands canoes used in raids on Hauraki and the east coast. Natives informed him that it held sixty men and all necessary stores for them on such voyages, but that it would carry eighty on bay trips or on any smooth water. He also states that he saw canoes 80 ft. to 90 ft. in length, and remarks, "These canoes go very quick through the water."

In Breton's *New South Wales*, published in 1834, we note the following: "Their canoes are the largest I have seen, some of them being 100 feet in length, by 12 or 15 in breadth; the body is formed of a single tree, but the ends are added, and highly carved or ornamented."

This unusual length may possibly have been seen, but the width given is doubtful; only a double canoe would be so wide.

In describing the return of an expedition to the Bay of Islands in 1820, Cruise says: "The fleet was composed of about fifty canoes, many of them seventy or eighty feet long, and few less than sixty. Their prows, sides, and stern-posts were handsomely carved, and ornamented with a profusion of feathers; and they generally carried two sails made of straw matting. They were filled with warriors, who stood up and shouted as they passed our boat, and held up several human heads as trophies of their success."

Again, this writer remarks: "The largest canoe we saw was eighty-four feet long, six feet wide, and five feet deep. . . It was made of a single *kauri* tree hollowed out, and raised about two feet with planks firmly tied together and to the main trunk, with pieces of the flax-plant inserted through them. The crevices were filled with reeds to make the canoe watertight. A post fifteen feet high rose from the stem and stern, which together with the sides was carved in openwork, painted red, and fringed with a profusion of black feathers. The chief sat at the stern, and steered the canoe, which was impelled by the united force of ninety naked men, who were painted and ornamented with feathers. Three others, standing upon the thwart-sticks, regulated the strokes of the paddles by repeating, with violent gestures, a song in which they were joined by every one in the vessel. The canoe moved with astonishing rapidity, causing the water to foam on either side of it; and we have observed other war-canoes cross the Bay of Islands in perfect safety when it was thought imprudent to lower the ship's boats."

Polack speaks of travelling in a finely finished canoe 72 ft. in length that had two triangular sails made of *raupo*, while the ropes thereof were made of "common flax," which may mean undressed *Phormium*. He also writes as follows of Maori canoes: "Some canoes are fully eighty feet in length, upwards of six feet beam, four feet in depth; the bottom being worked to the sharpness of a wedge, the sides are consequently well projected. . . A variety of hieroglyphics, resembling tattooing, adorns the hull, painted in white or black on a red ground. . . The canoes made in the vicinity of Hawke's Bay will carry easily one hundred men, and are paddled double-banked."

When Polack visited Uawa in 1835 he remarks that "about thirty canoes, each of a very large size, and filled with people," came off to meet his vessel. Again, he writes: "I purchased a canoe at Uawa that was seventy-six feet long, six feet wide, and four feet deep, the bottom being as sharp as a wedge. The sides were well projected, and about two inches thick, and near the bottom full three inches. On each side was raised a plank, to the making of which a whole tree had been used;

these were sixty-six feet in length, fifteen inches wide, and two inches thick, fitting to the hull by a piece of lath painted black and placed outside the vessel, which, when lashed, bound the gunwale board to the hull exceedingly firm, by holes being bored above and below the band [lath], fastened by flax well scraped. The small spaces of the holes were closed up with the down of bulrushes, which answered the purpose of caulking. A considerable number of thwarts were laid across the gunwales, and strengthened the compactness of the vessel by being securely lashed. The figurehead at the bow projected six feet beyond the hull, and was about three feet in height. The *rapa*, or stern-piece, was about twelve feet high, two inches thick, and eighteen inches in breadth."

The bottom "sharp as a wedge," does not recommend itself as a feature of the Maori canoe; possibly its sharpness near the prow was referred to.

Of a canoe seen at the Bay of Islands in 1835 Darwin wrote: "In examining one of their larger canoes, seventy feet in length, from three to four feet in width, and about three in depth, I was much interested by observing what trouble and pains had been taken in building and trying to ornament this (to them) first-rate vessel of war. Her lower body was formed out of the trunk of a single tree, the *kauri*, the upper works by planks of the same wood; the stem and stern, raised and projecting, like those of the galleys of old, were carved and hideously disfigured, rather than ornamented, by red distorted faces with protruding tongues and glaring mother-of-pearl eyes. Much carving of an entirely different and rather tasteful design (arabesque, like the ornaments at Tahiti) decorated the sides. Beneath the thwarts a wickerwork platform, extending from end to end, served to confine the ballast to its proper position, and to afford a place upon which the warriors could stand to use their weapons. From forty to eighty men can embark in such canoes. . . Judging only from description, the largest canoes ever seen by the oldest of the present generation must have been nearly ninety feet in length, formed out of one tree, with planks attached to the sides, about six or seven feet wide, and nearly as much in depth."

When traversing a forest near Matamata, Dieffenbach states that he saw (about 1840) "many large but unfinished canoes, hewn out of huge stems of *totara*."

In another place he says that he had seen canoes 80 ft. long. "The sails are triangular, and made of the light *raupo* rushes. They can sail very close to the wind, and are steered by a paddle."

The late Judge Fenton stated that, long years ago, he saw at Wai-heke a canoe over 90 ft. in length. Again, he remarks: "The Maoris of New Zealand build, or used lately to build, very beautiful and powerful canoes, capable of carrying one hundred men and more, with which, even in our time, they were accustomed to make voyages round the coast."

Bidwill mentions a canoe seen at the Thames that was 80 ft. long, and highly finished. It seems to have been captured from a party from the Bay of Islands.

Jameson speaks of having seen a war-canoe "of enormous size" at Waihou, that had been captured by the natives of that part from a party of Ngapuhi under Moko, that was almost annihilated on Great Barrier Island. Unfortunately, he does not give any dimensions.

Angas remarks that he saw a canoe 70 ft. long on the Waikato. The Rev. R. Taylor tells us in *Te Ika a Maui* that "The wood of the *totara* is preferred for canoes, and it is not unusual to see them more than seventy feet long, with a width of five or six feet, formed from a single log."

Colonel Mundy, in *Our Antipodes*, wrote: "Some of the larger war-canoes are from eighty to ninety feet in length, six feet wide and five feet deep, with high topsides and deck . . . capable of containing a hundred men, and propelled by ninety paddlers."

C. O. Davis states that Te Haupa, of Ngati-Paoa, felled a very large tree, which he intended to make into a war-canoe, but which was not finished. "Its length is said to be

118 feet, and its width about ten feet, and will carry, it is supposed, upwards of 700 men." This "700" is evidently a misprint, being much too high an estimate. The following note on an old unfinished canoe probably refers to the above. It was 90 ft. long, but 10 ft. or more of one end had rotted off. Even that was not its original length, for one end had been broken off in hauling it from the forest: the huge hull took charge and plunged into a gully. Its greatest beam was 10 ft.

In *Out in the Open* (1882) Mr. Potts tells of some canoes seen by him at Alexandra, the largest of which was 78 ft. long and 6 ft. wide.

The canoe known as "Te Mata o Turoa," at Whanganui, is 71 ft. long and 4 ft. 8 in. wide at the broadest part. The dugout hull is of one piece, except a short *haumi* a few

[*W. R. Reynolds, photo.*

FIG. 77.—THE "TOKI-A-TAPIRI" CANOE, IN AUCKLAND MUSEUM.

Length, 83 ft. A small river-canoe alongside. (See p. 119.)

feet in length at one end. Several patches have been put on near the fore end, and a few small pieces let in on the sides. It has no *rauawa* attached, and no prow or stern pieces: all have disappeared. Several bullet-holes and embedded musket-balls are seen in the canoe, which natives say date from fights early in last century. The prow end is long and sharp. Its name is marked on it as "Te Mata Hoturoa," which is probably intended for "Te Mata o Turoa," for Turoa was a chief of renown in those parts. *Te Mata o Hoturoa*, which possibly may be the correct form, is an expression denoting the crescent moon, or the cusps thereof.

The big war-canoe "Te Toki-a-tapiri," in the Auckland Museum, seems to be the only first-class Maori canoe that has been well preserved. (See fig. 77, p. 118.) It is a fine specimen, and its lines are admirable. The length of the hull is 83 ft. At the stern end is a *haumi* about 10 ft. in length; the rest is in one piece, hewn out of one huge trunk. Its greatest beam is about 7 ft., outside measurement, but only about 5 ft. 8 in. inside measurement, between the sides of the hull, showing that the top-strakes have a very pronounced flare. Depth of hold under thwarts, 2 ft. 8 in. On the under-side of the prow is carved a human figure looking downwards, such as is termed a *toiere*, or *parata*, and the design termed *puhoro* is painted on the same part. (See fig. 13, p. 33.) The deck or flooring of the canoe has not been correctly fixed, as it rests on the inner battens covering the join of the top-strake, which is not permissible. Also, the floor is badly laid, and lacks the *puna wai*, or bailing-places.

Mr. Featon, in his work on the Waikato war, speaks of a large canoe having been seized during the Waikato war. "The canoe was over seventy feet in length, was elaborately carved, and would carry 150 men. This celebrated specimen of Maori marine architecture was afterwards conveyed to England by one of the men-of-war. The canoe having been launched, it was taken in tow by the 'Lady Barkly' to Waiuku."

We believe that the above remarks apply to the "Toki-a-tapiri" canoe, now in the Auckland Museum. It was not taken to England, though its carved figurehead was.

The "Toki-a-tapiri" was made by natives of Hawke's Bay. Tutakangahau, of Tuhoe, informed the writer that he saw this canoe at Turanga about the year 1850. Mr. Barstow states that the Hawke's Bay natives gave her to Hone Ropiha in Governor Browne's time. He sold her to Ahipene Kaihau and others of Ngati-te-ata, at Waiuku, for £700. She was there seized by the military during the Waikato war and brought to Onehunga, whence she was taken across the isthmus to Auckland Harbour for the purpose of landing H.R.H. Prince Alfred.

The most interesting local canoe of which we have heard is one that was made at Whanga-nui fifteen generations ago for a chief named Rua-matatoa, concerning which Mr. T. W. Downes contributes the following notes: The canoe known as "Tauwhare-puru" was famed all over New Zealand as being the largest ever made by the Maori. It was hewn from a huge *totara* tree named "Nga Mahanga," and its two *haumi* were formed from two other trees having the special name of "Tauwhare-puru," which trees grow close together. This name was given to the canoe. (Probably the name "Nga Mahanga" was that of the double trunks.) The supervisors of the task of making this vessel, the *tohunga whaihanga*, or industrial experts, were Te Kowhiro and Pataua of Whanga-nui, also Taka-wairangi of Ngati-Tama, who came to assist them. The numerous workmen were local men. The various pieces having been roughed out, they were then buried in trenches, where they laid for months, after which they were taken up and laid on platforms exposed to air and wind, the same being a seasoning process.

Each *haumi* of this canoe was over 20 ft. in length, and on each side of the hull were lashed six *rauawa*, or top boards.

This form of vessel carries us to Polynesia; the Tahitian canoes were so built up. "Tauwhare-puru" is said to have accommodated 400 persons, including 144 paddlers. This seems very unusual, but the tradition is about four hundred years old, and may have grown as it passed down the centuries. The width of the canoe was half an arm more than a tall man could stretch. It is not explained as to whether the *maro* or *takoto* mode of measuring was meant; if the latter, then the width would be about 9 ft.

This great canoe was taken to the South Island and there given to local natives in exchange for manufactured greenstone (nephrite) objects, including three *mere* (weapons), six *mau kaki* (neck-pendants), and two *heitiki*.

Banks speaks of seeing a canoe carrying eighty-two people at a place north of Hauraki.

PART IV.

FISHING AND RIVER CANOES; CANOES OF CHATHAM ISLANDS; CEREMONIAL OBSERVANCES PERTAINING TO CANOES.

CONTENTS.

The *waka tete*, or fishing-canoe. Marked by plain figurehead and lack of adornment. Descriptions of ordinary canoes. The *waka tiwai*, or river-canoe. The Henley canoe, an abnormal form. Mending and patching canoes. Canoe fleets. Arrival of European vessels. Rafts and floats. Canoes of Chatham Islands. Ceremonial matters pertaining to canoes. The *mauri*. Canoes under *tapu*.

WE have now to deal with the ordinary canoes, and of these the fishing-canoes were the most important. These were vessels that were of a good size and fitted with top-strakes, and the hull of which might be in one piece, or two, possibly three if no big long-trunked trees were available. These craft were in many cases provided with

FIG. 78.—A SMALL FISHING-CANOE. [*A. Hamilton, phctc.*

prow and stern pieces of an inferior type, as will be seen by referring to the illustrations. In no case were the highly ornate fixings of the *waka taua* attached to the *waka tete*. The latter were employed in sea-fishing, for ordinary purposes of traffic, and also in warlike expeditions.

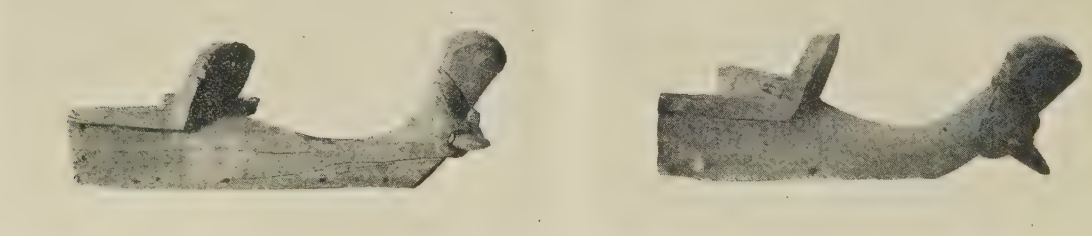


FIG. 79.—TWO FIGUREHEADS OF FISHING-CANOES.

"The *waka tete*," says Tuta Nihoniho, "were canoes with plain figurehead, were smaller than the war-canoes, and were used as fishing-canoes. The fittings, such as the bow and stern pieces, were plainly designed, and were fixtures, not being removed when the vessel was laid up, as was the case with the *waka taua*. The *waka tete* was fitted with top boards, and might, or might not, have one or two *haumi*, this depending upon the size of the trees available when making them."

The plain, armless figureheads on these canoes are known as *tete*, or *pakoko*, or *pakurukuru:* hence the names of *waka tete* and *waka pakoko* applied to these canoes. Forster (1773) seems to have seen but second-class canoes at Queen Charlotte Sound: "All those we now saw had not that profusion of carving and fine workmanship mentioned in Captain Cook's first voyage, which he observed in the canoes of the northern islands; but seemed rather old and worn out; they were, not, however, different in the general conformation from those described there, and always had the distorted human face at the head, the high stern, and the neat sharp-pointed paddles."

An old canoe of this class, named "Waiapu," now in the Dominion Museum, comes from Whanga-nui. (See fig. 42, p. 81.) It is said to be about one hundred years old: canoes of *totara* timber are remarkably durable. The length of the hull is 47½ ft. The width between the upper parts of the top-strakes, in the middle of the vessel, is 3 ft. 7 in., but the width of the hull at that part is but 2 ft. 8 in., showing how these top-strakes

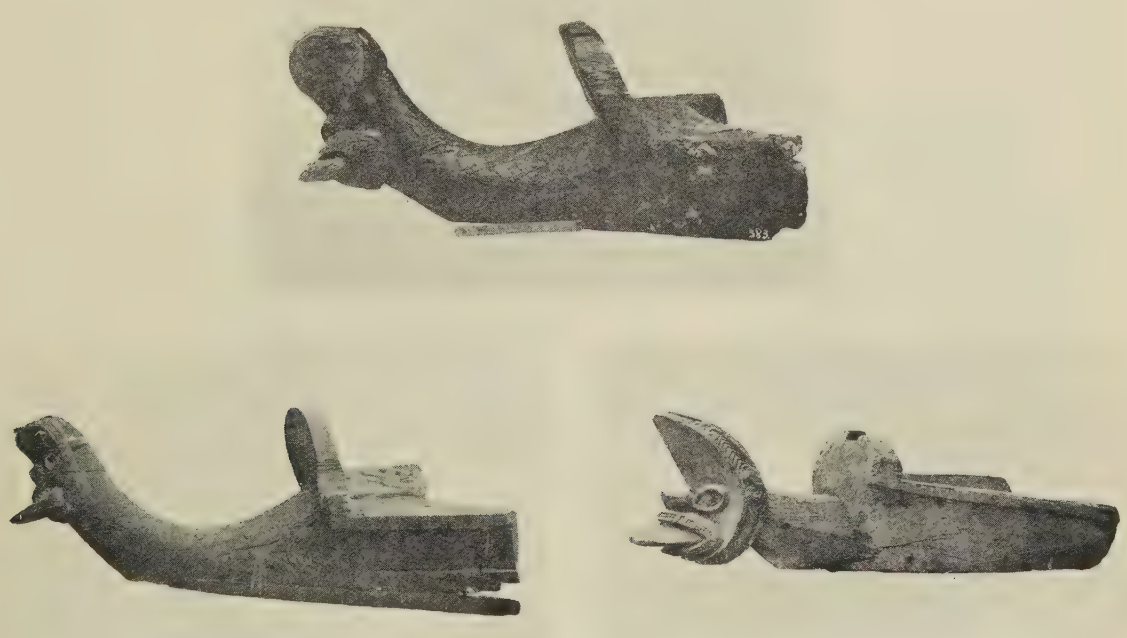


FIG. 80.—THREE FIGUREHEADS OF FISHING-CANOES.

increase the width of a canoe as well as its depth. The depth of the vessel in the middle is 16 in.

The top-strakes of this canoe are each 45 ft. in length, and each is a single plank without join. They are 5 in. deep at the stern end, 9 in. in the middle, and 5¾ in. at the prow end. This tapering-off from the middle towards both ends was a prominent feature of these planks, and counteracted or reduced the curve (sheer) in the sides of the hull. The spaces left uncovered by these planks at the prow and stern ends are occupied by the figurehead and stern-piece, which rest upon and cover the extremities of the hull, and are lashed to the ends of the top-strake planks. The upper part of these side-planks is 1¼ in. in thickness, which is reduced to 1 in. at 2 in. below the rim. There are eight thwarts, each 4 in. wide, and placed 4½ ft. apart, being lashed to the top-strakes in the orthodox manner, with lashings countersunk.

The cross-pieces supporting the flooring are from 18 in. to 20 in. apart, but no *tokai* (uprights) or longitudinal supports for the cross-pieces have been provided, which may

be accounted for by the fact that the deck or flooring was inserted since the arrival of the canoe at the museum. The floor is 8 in. below the level of the thwarts, and just below the level of the batten covering the junction of the hull and top-strake. The floor is of the style employed in fishing-canoes on the east coast. In each of the spaces between the thwarts is formed a receptacle for fish, so that each man might keep his catch separate. (See fig. 82, p. 123; also fig. 75, B, p. 109.) These have been formed by leaving an open space 18 in. square in the flooring between the thwarts. At each corner of these square openings a rod has been lashed in an upright position, its lower end resting on the bottom of the hull, its upper end projecting 10 in. or 11 in. above the flooring. Other intermediate rods have been placed between them, making eight in all. These are kept in position by being lashed to the flooring-rods. A piece of pliant *aka* (stem of a climbing-plant) has then been bent so as to form a hoop, on which hoop a net has been made of strips of undressed *Phormium* leaf. This hoop net

Fig. 81.—Projecting Heads of Figureheads of Fishing-canoes.

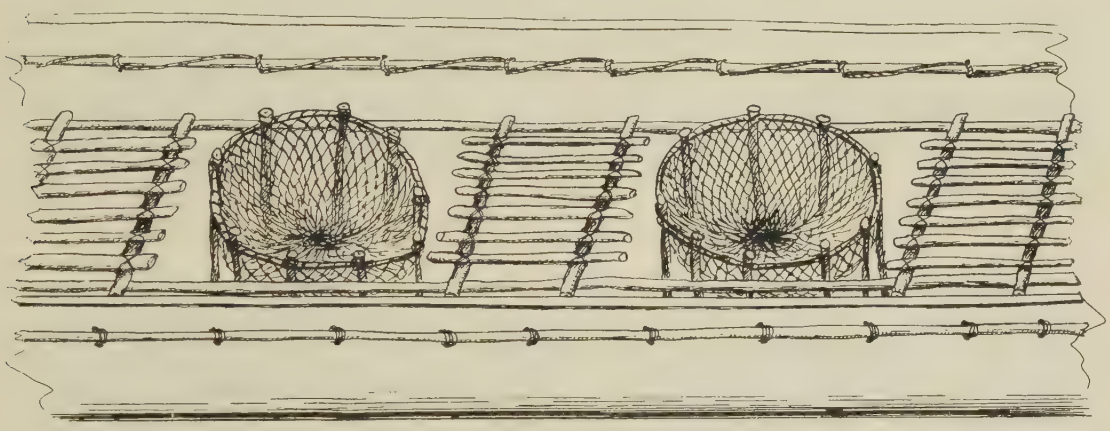
has then been attached to the upright rods above mentioned, the hoop being tied to the upper ends of the rods, and the round net hanging down inside the uprights so that its lower part is just below the level of the floor. Here, then, are the fish-baskets used by the men in the canoe.

The outer batten covering the top-strake join of this canoe has been painted black and white in alternate bands about 4 in. in width.

The canoe known as "Te Heke Rangatira" is a modern one, made in the "seventies," and was used principally for carrying cargo on the Wai-rarapa Lake. It was presented to the Dominion Museum by Ani Hiko, a chieftainess of the Rakai-whakairi clan of the Wai-rarapa district. It was named after the migration of her ancestors from Heretaunga to Wai-rarapa, under Te Rangi-tawhanga and other chiefs, eight generations ago. (See

Te Rangi-tawhanga
|
Te Umu-tahi
|
Te Mahaki
|
Te Hiha
|
Te Weranga
|
Hautu-te-rangi
|
Te Piata-o-te-rangi
|
Tama-hikoia
|
Ani Hiko.

The hull of this canoe is a very strong one, and is 46½ ft. in length. Width (inside measurement) of hull in middle, 44 in. The width between top-strakes at the same place is 4 ft. Unfortunately, the top-strakes are of European make and fixing,



[*Sketch by Miss E. Richardson.*

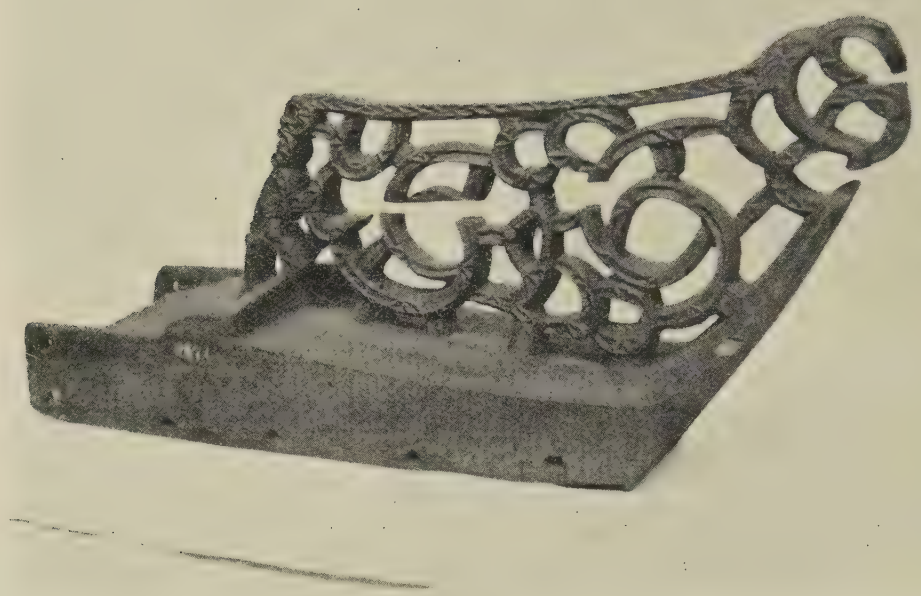
FIG. 82.—INTERIOR OF HULL OF FISHING-CANOE, SHOWING NETTED RECEPTACLES FOR EACH FISHERMAN'S TAKE.

Note that the net should have occupied the whole of the space, which is somewhat too big in this sketch.

are utterly unlike Maori work, and do not illustrate native methods. The fact of the top-strakes not being reduced in size towards the extremities has necessitated the packing-up of the prow and stern pieces in order to bring them flush with the upper parts of the strakes. This canoe has been fitted with the attachments of a *waka taua*, but the result is disappointing.

Canoe No. 1869 in the Dominion Museum is another of the *tete* class. (See fig. 41, p. 80.) It is 42 ft. in length; width of hull in middle, 3 ft. 4 in; width between top-strakes, 3 ft. 11 in; depth in middle, 17 in. The top-strakes and short *haumi* of this canoe have already been described. In this canoe the sheer, or upward sweep of the gunwale from the middle towards both ends, amounts to 9½ in.—that is to say, the sides of the vessel are 9½ in. lower in the middle than at the ends. This may be taken as being about the usual curve.

Another canoe of this class in the Dominion Museum consists of the hull only, the top-strakes having been removed. It is 36 ft. 8 in. long, and 24 in. wide in the middle, inside measurement; its depth is about 7½ in. The edges or upper parts of the sides are 1 in. in thickness, but the thickness increases downward to the keel, as is usual.



[*W. R. Reynolds, photo.*

FIG. 83.—AN UNUSUAL FORM OF FIGUREHEAD, IN AUCKLAND MUSEUM.

Said to have been fitted to a fishing-canoe near Mokau.

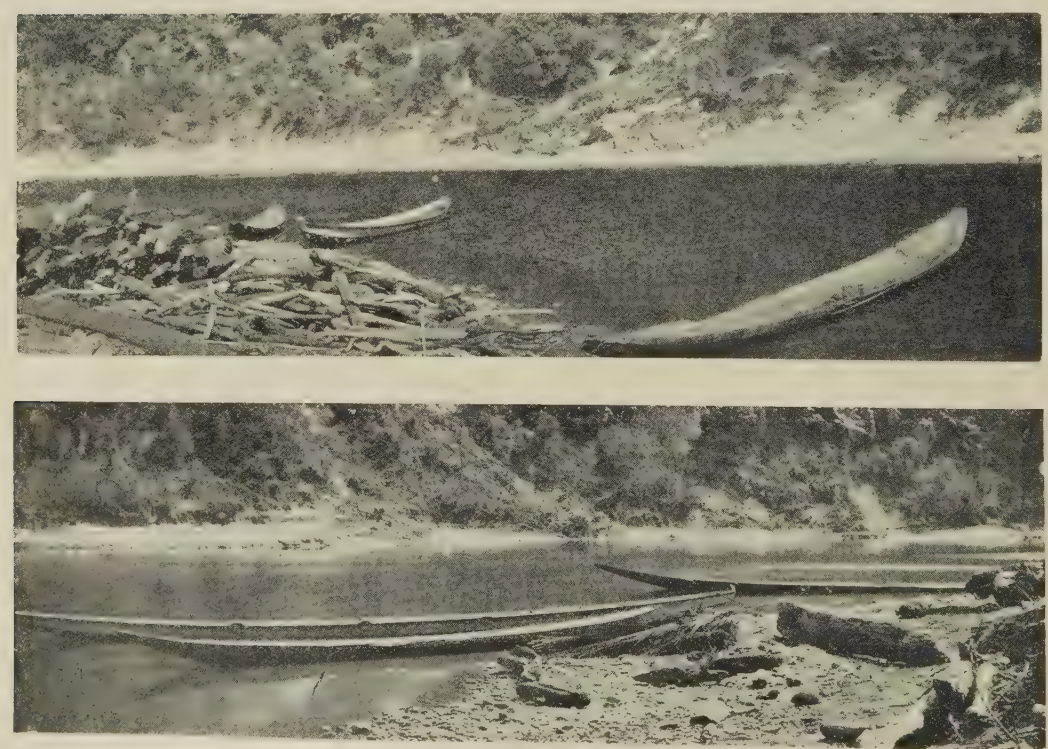


FIG. 84.—CANOES ON WHANGA-NUI RIVER (1921). [*Dominion Museum, photo.*

[*A. Hamilton, photo.*

FIG. 85.—A FISHING-CANOE.

[*Dominion Museum, photo.*

FIG. 86.—OLD CANOE NAMED "TE WEHI O TE RANGI," AT KORINITI, WHANGA-NUI RIVER. (See p. 126.

Rihipeti, of the Pamoana clan, poses for the camera.

Some river-canoes seen on the Whanga-nui River in 1821 ranged from 34 ft. to 61 ft. in length. Some of these have been fitted as *waka tete* in former days. Follow a few particulars concerning dimensions:—

Length.	Greatest Width.
34 ft. ..	.. 38 in.
52 ft. ..	.. 47 in.
61 ft. ..	.. 47 in.

This largest canoe, named "Te Wehi-o-te-rangi," was formerly a noted racer, and has a sharp, boat-like keel. It was paddled up rapids where other canoes had to be poled. (See fig. 86, p. 125.) A canoe 31 ft. in length had a beam measurement of 23 in.

The Waka Tiwai.

The *tiwai* (*waka tiwai*) was a smaller canoe than the *tete*, and was not fitted with topsides. Usually a *tiwai* was made in one piece. They were river-canoes, but might occasionally be used for sea-fishing near the land, though not for deep-sea fishing. Such

[*Burton Bros., photo.*

Fig. 87.—Fishing-canoe, showing Paddlers and Steersman.

a craft might contain from five to ten persons: thus they were of different sizes. These vessels were not provided with thwarts, and were not ornamented in any way. As a native informant expressed it, "*Te waka tiwai kaore ona haumi, kaore ona rauawa, kaore ona tauihu, kaore ona taurapa*" ("The *waka tiwai* had no *haumi*, top-strakes, prow or stern pieces"). The name *tiwai* in itself denotes the lack of accessories, and implies a plain dugout hull. Occasionally the form *tawai* is heard.

In his account of the arrival of the first vessels of the New Zealand Company at Port Nicholson, Wakefield says: "Several canoes came off. . . One of them, a low skimming-dish thing without topside-planks, filled and turned over, ducking six or seven natives, including a woman, who were passengers. They seemed to be perfectly used to such accidents, and some hung on to the bottom of the canoe while the others swam with one hand and gathered the paddles which had gone adrift."

Wakefield describes a canoe in which he ascended the Whanga-nui River as "a very graceful, light-looking vessel, without topsides, but with tapering head and stern well peaked up at either end; about thirty feet long, broad in the beam, quick and handy to paddle, and adapted for six people. She was painted a bright red with *kokowai*."

Captain Cook soon became acquainted with the crank nature of the Maori canoe, for at the place he calls Tegadoo, in the east coast, Mr. Banks and seven of his companions were capsized in the surf: "Not being used to a vessel that required so even a balance, they unfortunately overset her in the surf."

Fig. 88.—A Small River-canoe.

Angas makes the following remarks concerning one of his river trips: "Our canoe was too deeply laden; and though we were in still water, its edge was frequently not more than a couple of inches above the surface of the stream. The paddles were plied with great spirit; the exertions of the natives being stimulated by the animated shouting song kept up incessantly by one or another of the party. . . Their wild deafening

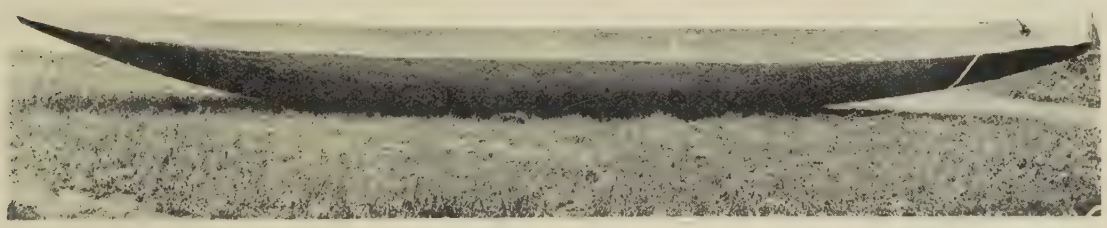


Fig. 89.—A Very Small River-canoe, Waikato District, in Canterbury Museum

songs, with their heads all undulating at every stroke, the contortions of their eyes, and their bare tawny shoulders, finely developing their muscles as they all dashed their paddles simultaneously into the water, rendered the scene at once novel and animating. The canoe-songs are generally improvised, and frequently have reference to passing objects. , , The native art of balancing a canoe is extremely nice, the slightest

preponderance of weight on either side being sufficient to upset it. From a want of proper caution in having the canoe exactly balanced, Europeans have frequently lost their lives by being capsized. Meeting a large canoe on the river, well manned, as it approaches end on, with all the paddles dashing into the water at once, has a curious effect; giving one the idea of a huge centipede moving along."

In describing his range from Mayor Isle to Mercury Bay, Captain Cook remarked on the inferiority of the canoes to those he had previously seen on the east coast: "Three canoes came off to us from the main, with one-and-twenty men on board. The construction of these vessels appeared to be more simple than that of any we had seen, they being nothing more than trunks of a single tree hollowed by fire, without any convenience or ornament."

Again, of the natives of Queen Charlotte Sound he writes: "In comparison of the inhabitants of other parts of this country they are poor, and their canoes are without ornament." Of three canoes seen in the vicinity of Cape Palliser he remarks that they were "distinguished by the same ornaments which we had seen upon the northerly part of the coast."

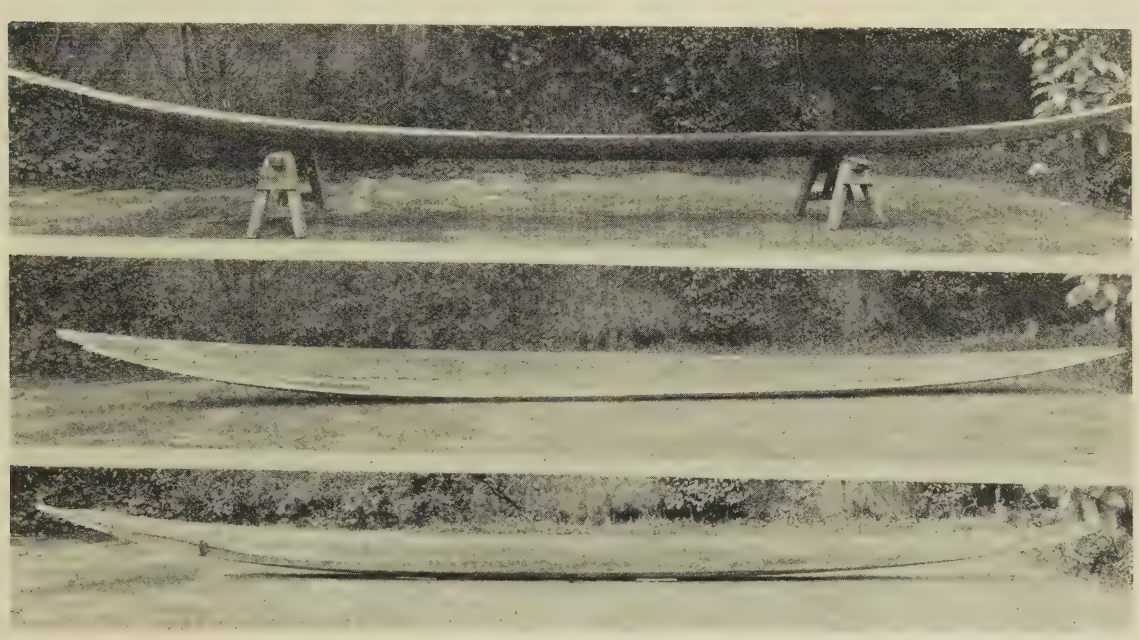
Of all the many canoes that were in use at Wellington in the early days of its settlement, only one apparently has been preserved. This is a small vessel of the *tiwai* type, 31 ft. in length, though it had evidently been fitted with top-strakes, as shown by the lashing-holes along its sides, a somewhat unusual feature in so small a canoe. This small vessel is remarkable for its sheer, or upward curvature to prow and stern, which amounts to 11½ in. — that is to say, a line drawn taut from prow to stern is 11½ in. above the sides of the canoe in the middle. The widest part is not in the middle, but nearer the stern, where it is 31 in. wide, at 20 ft. from the prow. The lower parts of this shallow hull are 1½ in. thick; the gunwales are 1 in. in thickness. The keel is sharp at both ends, but flattens toward the middle. (See fig. 90, p. 129.)

Mending and patching Canoes.

A split in a canoe was plugged with *raupo* down,* and in many cases holes were bored on either side of the split, and a batten so lashed on to cover the caulked flaw, a process described by the word *tapi*. On the outer side the lashings would be countersunk, as in lashing a *haumi*. An old Maori saying is "*He aurukowhao, apa he takere-haia*" ("It is merely leakage through the lashing-holes; 'tis not as if it were a split hull")—a saying applied to minor misfortunes. We also hear a transposed form—"*E hara i te aurukowhao, he takere-haia*" ("It is not a trivial leakage, but a split keel"). Yet another form is "*He pakaru a ihu, e taea e koe te whakaaro; ki te pakaru i te takere o te waka, e kore e taea te whakaaro*"—implying that a damaged canoe-prow may be easily fixed, but a split keel is a very serious matter. A native correspondent has the following in the *Waka Maori*, a Maori newspaper, of the 3rd July, 1877: "*He whakatauki—'Waiho kia pakaru ana, he pakaru waka taua'*" ("A saying—'Let it remain broken; it is broken as a war-canoe is'"). He proceeds: "*Ahakoa titiro atu kua horo nga rauawa kei raro, me nga takaa, me nga taumanu, me nga* taitua, *kino rawa atu ki ta te kuare titiro atu, kua karangatia—'E, he taua,'—kua oti te haumi, kua piri te* kakariki *o te niao, kua eke nga* oa, *kua piri te whara, kua piri te takaa, kua* ngahua *te taumanu, kua aukahatia, kua oti, purupuru ana ki te tahuna, e puhi ana ki te kereru te ihu, te noko, tatai rawa ki te toroa* paikare: *I kino ra hoki i tona pakarutanga, a oti rawa ake nei i te aukahatanga hou me te mea ano ko tona otinga tuatahi.*" Thus he explains how such a vessel may appear to be in a truly deplorable condition, apparently past repair to non-expert eyes, with its parts fallen apart, yet, let the cry of "The enemy!" be heard, and then behold how the scattered parts of

* Pappus of seed of *Typha angustifolia*.

the war-canoe leap together! The *haumi* is relashed, the top-strakes restored and secured, battens fastened, thwarts fixed, caulking of seams, &c., done, and the whole vessel properly adorned, making her look as she did when new. The romanized words in the foregoing narrative are unknown to the writer.



End View of Canoe.

DIMENSIONS.

Length, 31 ft.

Width (outside measurement):—

7 ft.	from prow,	23 in.
11 ft.	,,	27¾ in.
20 ft.	,,	31 in.
23 ft.	,,	28¾ in.
29 ft.	,,	13 in.

Depth from straight line from prow to stern to bottom of canoe:—

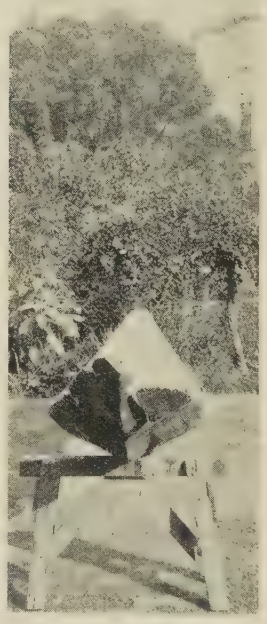
3 ft.	from prow,	7 in.
6 ft.	,,	12½ in.
10 ft.	,,	16 in.
12 ft.	,,	16½ in.
15 ft.	,,	17½ in.

Sheer:—

11½ ft.	about middle or little towards stern.	
20 ft.	from prow,	10½ in.
23 ft.	,,	9½ in.
29 ft.	,,	2½ in.

Thickness, 1½ in. on bottom and near it; 1 in. at gunwale. Widest part near stern. Keel sharp at prow and stern.; middle flat.

[*H. Hamilton, photo.*]



End View of Canoe.

FIG. 90.—A SMALL CANOE USED BY THE LATE MR. W. B. D. MANTELL AT WELLINGTON IN THE "FORTIES" FOR FETCHING INCOMING MAILS FROM VESSELS IN THE ROADSTEAD. (See p. 128.)

Williams gives: "*Tawake*—to repair a hole in a canoe. *Rau tawake*—piece of wood inserted to stop a hole; patch. *Whakakiko*—patch on a canoe, let in like a plug."

In his interesting remarks on Maori customs regarding rights to property Mr. Colenso says: "Any wreck driven on shore, a wreck of any kind, or even a canoe and

property of friends and relatives upsetting off a village, and drifting on shore where a village was, became the property of the people of that village, although it might be that the people in the canoe had all got safely to land, or were coming by special invitation to visit that very village. . . Strangest of all, the people in the upset canoe would be the first to resent, even to fighting, any kind alleviation of this strange law."

In connection with a European boat wrecked at Turakina, Wakefield says: "Pukeroa . . . loudly asserted that, when a boat, canoe, or ship was wrecked, all lookers-on were entitled to whatever they could pick up. He was much delighted at having found a case of bottled gin."

Fleets of Canoes.

A fleet of canoes is known as a *kaupapa;* hence the expression *kaupapa tahuri* (capsized fleet) as denoting a serious disaster.

The numbers of canoes seen by Cook were considerable, though he landed at few places. Thus, on his first voyage, apart from the smaller numbers, he speaks of seeing seven near Poverty Bay on the 11th October, 1769; five off Portland Island on the 12th; nine on the 13th; a fleet of forty-five on the 1st November, in the Bay of Plenty; "many canoes" opposite the Rurima Rocks, on the 2nd November; "some hundreds of large canoes" on the 3rd November; twelve at Mercury Bay on the 4th November; a "great number" on the 5th November; and so on.

In speaking of that part of the Bay of Plenty adjacent to Mayor Island, Cook remarks that it "appeared to be well inhabited; many towns were in sight, and some hundreds of large canoes lay under them upon the beach."

Nicholas, who visited the Bay of Islands district in 1814–15, writes: "We descried at an early hour a fleet of canoes, crowded with men, making towards the ship. . . . The approach of the canoes to the ship was marked with a wild grandeur of the noblest description, and it was impossible to behold the scene without being impressed with the force of its distinctive sublimity. The different chiefs were all standing up with their war-mats thrown gracefully over their shoulders, their hair neatly tied in a bunch upon the crown of the head, and ornamented according to the general fashion of their country with the white feathers of the gannet. Their attitudes and gestures, violently impetuous, as if intent on making an immediate attack upon the vessel, might strike the most resolute beholder with terror; and their fierce countenances, furrowed over with hideous punctures all deeply painted with a blue pigment, or quite black, gave a horrible identity to the savage display. . . The warriors who paddled the canoes had taken off their war-mats, that they might have the more freedom at their labour, and, exerting their brawny arms without intermission, with their spears and other instruments of war placed beside them, they soon worked up alongside."

In his account of native wars Mr. S. Percy Smith writes: "In the beginning of 1817, Mr. Kendall notes that a naval expedition, under the command of Hongi, sailed from the Bay of Islands. It consisted of thirty canoes and about eight hundred men."

It took fifty canoes to convey Te Morenga's expedition to Tauranga in 1820. In 1821 Hongi left the Bay of Islands on one of his savage forays with between two and three thousand fighting-men in over fifty canoes.

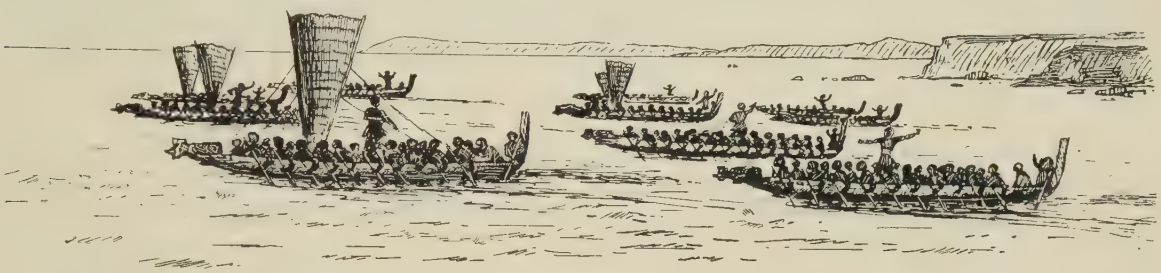
Mr. J. A. Wilson, in his *Story of Te Waharoa*, tells us that when the missionary schooner "Herald" visited the Bay of Plenty in 1828 the natives of Tauranga were very numerous, and that one thousand canoes, great and small, were counted on the beach between Otumoetai and Te Papa.

At a mission station at Hokianga we are told that as many as sixty canoes full of people used to visit the place every week, each canoe containing from twelve to twenty persons.

Wakefield mentions a fleet of thirty-three canoes coming down from Whanga-nui to Kapiti in 1840, bearing three hundred natives and two hundred hogs. These canoes were brought to land each night (as was usual). He also speaks of a fleet of twenty or thirty crowded canoes that came down the river to Whanga-nui. "Closely touching each other, they glided in silence round the point; and, as they came full in sight, discharged their firearms in a grand volley."

Wakefield describes ascending the Whanga-nui River in company with a fleet of canoes in 1841: "There were about twenty canoes, varying in size from the stately war-canoe in gala dress of clean feathers and oiled carving, with its crew of forty warriors, to the low shell in which five little naked urchins pushed along, screaming and yelling with delight . . . and laughing at the upsets which attended them at nearly every rapid." At another place he speaks of a fleet of fifty canoes on the river.

In the *Wellington Independent* of the 22nd August, 1846, appeared the following local item: "Six large canoes, manned with about sixty natives, entered the harbour yesterday, laden with pigs and potatoes. Twelve more canoes are to follow, the Ngatiawas having crossed the straits for the purpose of joining their tribe, if required, against the rebels under Rangihaeata."



[*Sketch by Miss E. Richardson*

FIG. 91.—A FLEET OF WAR-CANOES ON A RAIDING EXPEDITION.

From an early missionary publication. The sails are well depicted. (Reproduced in Brett's *Early History of New Zealand*, p. 135.)

CANOE-SHEDS.

Long sheds with open wall spaces, called *wharau* and *tawharau*, were erected in order to shelter the superior canoes of the *waka taua* type. When a high-class canoe was stowed in its shed for some time the ornamental stem and stern pieces were taken off and stowed away, and *manuka* brush, or some similar material, would be tied along the walls in order to protect it from the weather. A war-canoe would be so housed when not required. The days when men dwell in peace are described by the term *Ruhanui* (*Ka kiia ko Ruhanui te noho o te tangata*).

Polack writes: "Houses are erected for war-canoes. In the gable part above families often reside. The ground floor of these houses have rollers to preserve the canoe from rotting beneath." For "rollers" read "skids." The same writer remarks: "In approaching bad weather canoes are carefully hauled up, care being taken (as with boats) to keep them on an even keel, to prevent straining." When required for use a dismantled *waka taua* had to be refitted, a process termed *aukaha*, because all its fittings were lashed on.

Any place where canoes are anchored, secured to posts or stakes, is called a *tauranga waka*. Each canoe is tied to a separate stake.

Occasionally fighting in canoes took place, but the ordinary single canoe was not suited for this work. When engaged in such fighting a rude grapnel or grapple was sometimes employed. It was termed a *rou*, and was simply a long pole with a round

FIG. 92.—OLD RIVER-CANOES, MINUS PROPER FITTINGS, UTILIZED FOR RACING, WAIKATO RIVER.

hoop of tough *aka* lashed to one end. This hoop was slipped over the upstanding prow or stern-piece of the enemy's canoe, in order to hold it.

Canoe-racing (*hoehoe waka*, *kaipara hoehoe waka*, and *whakatere waka*) was a favourite exercise in former times, and highly exciting contests took place. In 1843 twenty canoes

FIG. 93.—PREPARING FOR A CANOE-RACE, WAIKATO RIVER

entered for a contest at the then new settlement of Whanga-nui. On the 2nd January, 1852, a regatta was held at Wellington in which three canoes, each manned by thirty-eight men, took part. This spectacle, with the demonstrations among the excitable

Fig. 94.—Canoe-races on Waikato River: Women Competitors in Canoe Hurdle Race.

One canoe has its name—"Motuka" (*i.e.*, Motor-car)—plainly showing.

Fig. 95.—Canoe-race on the Lake at the Christchurch Exhibition, 1907.

natives present, impressed new arrivals from England, according to the journals of that time. In recent years canoe-races have been held on the Waikato River. (See figs. 92, 93, 94, pp. 132, 133.)

Crawford, in his account of an expedition up the Rangi-tikei River and to Taupo in the early "sixties," speaks of encountering a party of Taupo natives at Ma-kohine, who "were making a bark canoe to take them down the river." We have no other evidence that the Maori ever made canoes of bark, and natives questioned on the subject state that none were used. Possibly dry *totara* bark was used in making some form of raft.

Many interesting discoveries of partially hewn canoes have been made in the forest by bushmen and surveyors. These derelicts have for some reason been abandoned, the hewn hull being left in the bush.

A surveyor from the Whanga-nui River lately informed us that he found two canoes that, many years ago, had been made in the forests of that region and never hauled out. Both were of heart of *totara*, and so old that the bottom parts had completely rotted away. Another, found in the forest near Hokianga, had several stone adzes lying near it.

Thomas Moser, in his *Mahoe Leaves*, tells us of the curious use he saw a canoe put to at a native feast: "When the rice was served up . . . having no dish fit to hold enough, they cleaned out a canoe some thirty feet long, two feet and a half wide, and

[*Muir and Moodie, Dunedin, photo.*

FIG. 96.—A CANOE-RACE.

about the same depth, and emptying, I imagine, about two bags of boiled rice into it, they tilted in a bag of sugar, and mixing up the lot with a spade, they crowded round the steaming mess with oyster and mussel shells in their hands, and set to in earnest."

EUROPEAN CRAFT.

In speaking of the Maori of the Bay of Islands as he saw them in 1840, Wilkes says: "The greatest changes which have taken place in their customs are the introduction of the use of firearms, and the adoption of the whaleboats instead of their canoes."

European ships were named *kaipuke* by the Maori, but why that term should have been selected we know not. Tuta Nihoniho made the following remarks on the subject: "The term *kaipuke* is applied to ships only, and does not seem to have been used prior to the advent of European vessels in these waters. Such vessels were at first termed *puke*, on account of their size and great height above water. With sails set, they were a very impressive sight to the Maori; the ships looked like hills, hence *puke*." Tuta thinks that the name *kaipuke* was applied to European ships because food was cooked and eaten on board, an unusual occurrence on board native canoes. This

surmise does not appeal to me. Colenso's guess was that it meant "a floating hill possessing valuables." Hoani Nahe thought that a ship was called *kaipuke* because the crew had their meals on board (no food could be eaten on board a Maori canoe). But Louis Becke states that the natives of the Gilbert and Kingsmill Groups also call a ship by the same name (see *Journal of Polynesian Society*, vol. 4, p. 155). In isles near New Ireland foreigners are styled *kaibuke*.

In Tongan *buke* is the deck of an canoe, also at Niue. The word *puke* was apparently used to denote a large canoe in several Polynesian communities, as at Taumako, and east coast natives applied it to Cook's vessel. The word *pahi* was also employed by the Maori to denote a large sea-going canoe. Cook's vessel is still remembered on the east coast as Te Puke o Te Paea (The Ship of Te Paea). This "Te Paea" may be for Tupaea, Cook's Tahitian interpreter; but there is a story told by Mr. Uren, of Poverty Bay, to the effect that Cook was called Paea by local natives, so called from his command of "Fire!" during the quarrel at Turanga-nui. A species of turnip or cabbage, seeds of which were obtained from Cook's vessel, was also named *paea*.

According to Ellis, the Tahitians imagined that the first ships they saw were islands; their inhabitants supernatural, vindictive, and revengeful beings.

In his account of Cook's sojourn at Easter Island in 1774, Forster describes the visit of some natives to the vessel: "They expressed the most unbounded admiration at every thing they saw, and every one of them measured the whole length of the vessel from stem to stern, with his extended arms; such a great quantity of timber of so stupendous a size being altogether incomprehensible to people whose canoes were patched of many small bits of wood."

In describing the visit of a Maori to Cook's vessel at Dusky Sound in 1773, Forster says: "The number and strength of our decks and of other parts of our vessel engrossed his admiration more than anything else."

On the 6th February, 1770, an old Maori of Queen Charlotte Sound told Tupaea (Cook's Tahitian interpreter) that no such vessel as Cook's had been seen in those parts before, but that they had a tradition that "there came once to this place a small vessel from a distant part, wherein were four men that were all killed upon their landing."

Banks states that an old native of Queen Charlotte Sound informed Tupaea that "they had a tradition of two large vessels, much larger than theirs, which some time or other came here, and were totally destroyed by the inhabitants, and all the people belonging to them killed."

Cook also mentions that he heard at Queen Charlotte Sound that a ship had been wrecked on the coast of Terrawittee—a name that he seems to have used as including lands from about Port Nicholson northwards towards Otaki. We have gained no knowledge of any such traditions in later days, except a vague one concerning the ship of Rongotute that is said by Wai-rarapa natives to have been wrecked at Palliser Bay many years ago.

The First Paddle-wheel Boat in New Zealand.

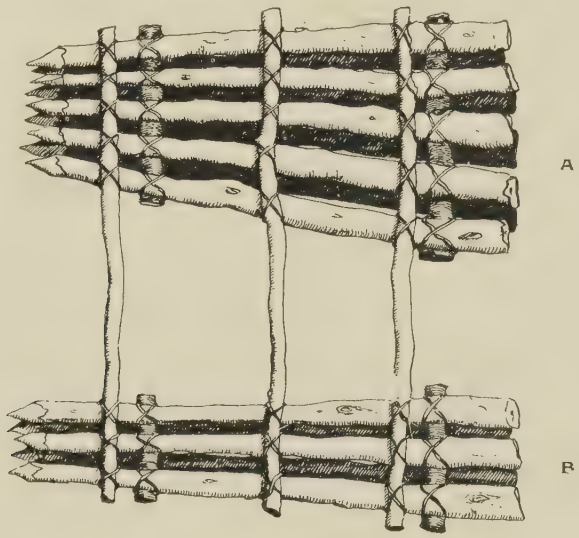
An early traveller in New Zealand speaks of the amazement of the natives on the Wai-hou River when they saw the first paddle-wheel vessel on those waters: "The projector of the excursion constructed a pair of paddle-wheels to attach to his whaleboat by an iron crank fixed to the axles. . . Two of us sat . . . facing each other, and worked the crank. . . We contrived to propel her along as fast as four men with oars could have done. . . We excited the utmost astonishment all along as we went, the natives crowding down to the beach to gaze at us. . . They spread a report of some white men having visited their place in a boat propelled by two grindstones." This misconception hinges upon the word *huri*, which means "to revolve," but is used as a noun to denote a grindstone that revolves.

Rafts and Floats.

Colenso remarks: "Besides their canoes, they sometimes made use of rafts for crossing streams and inlets when the water was deep; such, however, were only made for the occasion, of dry bulrushes, or the dry flowering-stems of the flax (*Phormium*) plant, tied together in bundles with green flax. In some places, as about the East Cape, where there are no harbours, the natives made use of an open frame-like raft of light wood, on which they went out to sea for some distance; and of late years have not unfrequently visited ships on such."

Concerning the east coast form of raft, Tuta Nihoniho contributed the following description:—

A form of *mokihi*, or raft, was formerly constructed by the Ngati-Porou folk of the east coast, the people of the more placid *tai tamawahine*, who used it as a fishing-craft, on which they went out to sea fishing off the coast, but not to any great distance. There were two forms of this raft, of which the following is some description.



[*Sketch by Miss E. Richardson.*

Fig. 97.—Peculiar Double Form of Raft employed by Fishermen on the East Coast of the North Island.

A. *Mokihi.* B. *Ama-tiatia*, or outrigger.

The material used was the *houama* (syn. *whau*), or *Entelea arborescens*, an extremely buoyant wood. Pieces of this timber, of considerable thickness, perhaps 6 in., were cut, barked, and seasoned. From four to six of such pieces were fastened together in single tier and side by side, but so fashioned as to be narrow at one end and wide at the other, the former representing the bow of the primitive craft. The different logs were pinned together with trunnels of hard wood, such as *manuka*, which, it is said, if properly prepared, could be driven through the soft *houama* wood without any form of hole being made to receive them. A second layer of timbers, consisting of poles of *houama*, was laid fore and aft upon the larger pieces, and lashed thereto, thus increasing the thickness and buoyancy of the raft. As an additional safeguard the various pieces were lashed together with the extremely tough, strong, and pliant stems of the *pirita*, a climbing-plant (*Rhipogonum scandens*). (See fig. 97.)

This float being completed, another and similar one was constructed. The two parts of the raft were then placed parallel to each other, the pointed ends one way, but

separated by a space of from 3 ft. to 5 ft. Across the two separate rafts were now placed and secured by lashing three or four stout poles to serve as transoms.

The raft was now complete, and, when used, was occupied by two persons, one sitting on each division of the raft, and propelling it with the paddle. They were used for fishing from, and from which to manipulate the *taruke*, or crayfish-pots (traps), so much used along the coast. When engaged in such pursuits it was usual to make a platform between the two parts of the raft by placing some additional poles across, on which the *taruke* were deposited.

These rude craft were provided with a stone anchor, maybe with the curious form made by lashing two short poles at right angles across a heavy stone. Should a foul wind spring up when men were fishing off shore from a *mokihi*, then would they cast their anchor and ride out the wind. The water would sometimes break over the raft, and spray drench its small crew, but the rude craft was particularly buoyant, and rode like cork.

These craft were called *amatiatia*, a name applied to the outrigger. In this crude form, then, we see the last survival of the old double canoe and the outrigger of Polynesia, in which the ancestors of the Maori explored the vast Pacific to settle on far-scattered isles.

In former times it was not an unusual occurrence for fishermen to be blown out to sea by sudden gales, to be lost for ever on the great waters.

Colenso made the following remarks on these east coast rafts, as seen by him in 1838: "I may also mention that all along the coast, in many places, we saw small rafts hauled up above high-water mark, each being eight or ten feet long and three or four feet wide, composed of only a few small poles, roughly and distantly but very strongly lashed together, with open spaces between them. On these the east coast Maoris went out to fish in deep water, one on each; and also, when opportunity offered, to a ship, with a pig or two fastened to the raft. They said these rafts were quite safe—more so, indeed, than a small or middle-size canoe, as there was no danger of upsetting."

Colonel Gudgeon relates a case in which a small party of natives made rude rafts and crossed twenty miles of sea in order to escape from enemies.

When asked by Jameson how he managed to cross many rivers during a certain journey he had made, a Maori replied, "By making a raft of the *manuka* bush, with reeds and sticks, which we tied together with flax (*Phormium*). Give me these things, and I will cross the largest river in New Zealand."

In some places on the east coast the term *mokihi* is, or was formerly, applied to a very small canoe, the smallest size, suitable for one person only.

In April, 1773, Captain Cook saw some natives at Dusky Sound. The first family seen, on the 7th April, was composed of one man, three women, and three children, who were provided with a small double canoe. Tame Parata informs us that in his youth he heard old men saying that the man seen at Dusky Sound by Cook on that occasion was named Te Apa-a-raki (raki = rangi), and that these were the only natives of the far south who saw Cook. Cook, however, mentions seeing a few other natives at Dusky Sound, who were using rude rafts composed of logs.

The other type of raft mentioned by Colenso may be described as a float, though both timber raft and reed or bulrush floats were called by the same names—*mokihi*, and *moki*. There were two forms of these floats: one was a small affair, a bundle of dry bulrushes or flower-stalks of *Phormium*, which a person bestrode, paddling with his hands or a piece of wood; the other was a more elaborate and a larger float, composed of several or many such bundles lashed together so as to resemble a boat in form.

In Bishop Selwyn's diary of his journey in the South Island in 1844 he remarks that on the 17th January of that year he crossed the Wai-tangi River on a *mokihi*, under the care of Te Huruhuru, a native of those parts. "The *mokihi* is formed of bundles of

rushes bound tightly together in the form of a boat. No kind of boat could be better suited to the river, which is a deep and rapid torrent. . . To cross it it is necessary to start at some point where the main stream touches the bank, and to keep the same channel till it winds its way to the opposite bank; in order to do which it is sometimes necessary to go down the stream several miles. The *mokihi* are first built twenty or thirty miles from the mouth, and perform the zigzag course till they reach the sea, where they are turned adrift, it being impossible to work them up against the stream. Te Huruhuru himself took me under his care, with the whole of the baggage. . . We launched off and made a rapid and prosperous passage to the opposite bank, going down about two miles of the river before we could reach it."

Tuta Nihoniho contributed the following note: Rude rafts, termed *mokihi*, were sometimes made whereon to cross rivers, of dry *raupo* (bulrushes) or timber. If the former, the *raupo* leaves were tied in bundles about 8 in. in diameter, after which several of such bundles were lashed together to form a large one. Three of these large bundles were lashed together side by side, and two more tied on top of them, so as to break joins. Upon these two upper bundles travellers placed themselves, propelling their rude craft with poles.

Brunner speaks of making crude rafts during his west coast explorations in 1846: "April 21. The [Karamea] river much flooded. Constructed a raft of flax-stalks, in length about twenty-two feet and in breadth about four feet six inches. A raft of this

[*Copied by Miss E. Richardson.*

FIG. 98.—THE BUILT-UP OR BOAT-LIKE FORM OF MOKIHI.

From a sketch in the possession of W. Mantell, Esq., Wellington.

kind is now but seldom seen. I will therefore give a description of its construction: A sufficient quantity of the dry flower-stalk of the flax (*Phormium*) being collected, which is not done without considerable labour, it is lashed tightly into bundles, each about ten inches in diameter, and twenty or twenty-four feet long. Two of these bundles are then placed side by side, and are equivalent to the garboard streaks or planking next to the keel of a boat. They are left with square butts aft, and the natural bend of the stalk being taken advantage of, the bundle is formed convex in its length towards the water; the top or slender part of the stalk is placed forward, and the pointed end of the bundle becomes the head or cutwater of the craft. Two other bundles similar to the first are now lashed outside and slightly above them, and the four form the bottom. Projecting gunwales are now formed of two additional bundles, which are placed over and slightly outward of the last; and the inner, hollow part of the raft, being filled up with the refuse stalk, with a pole placed lengthwise to give it strength, the vessel is complete. Paddles have then to be cut, and a mast with a blanket sail may be rigged if the wind be fair. Our raft could be carried by the four of us. With our weight of some 700 lb. upon it, it floated with the upper surface about an inch above the water. It was sufficiently strong to rise over a considerable swell without working loose, and might be paddled at the rate of about two miles an hour. . . The flax-stalk is, however, of an absorbent

nature, and before we had far passed the middle of the stream we found, by the decreasing buoyancy of the craft, that it was necessary to throw overboard the dog."

The following extract is from Shortland's *Southern Districts of New Zealand*: "Our *mokihi* was made in the form of a canoe. Three bundles of *raupo* about eighteen feet long and two feet in diameter at the centre, but tapering towards the extremities, were

[*Sketch by Miss E. Richardson.*

FIG. 98A.—A BALSA, OR REED BOAT OF PERU.

From *Natural History*, the Journal of the American Museum.

first constructed separately, each being tightly bound and secured with flax; and were then fastened together so as to form a flat raft. Another bundle similarly made was next laid along the middle of this, and secured in that position, forming a sort of keel; the hollow intervals left between the keel and sides were filled up with *raupo* packed carefully and tightly in layers, and secured with bands of flax. The bottom of the *mokihi*

[*Sketch by Miss E. Richardson.*

FIG. 99.—FORM OF REED BOAT USED IN MESOPOTAMIA.

being thus finished, it was turned over, and two smaller bundles were laid along its outer rim, from stem to stern, for topsides, and all the vacancies within were filled up with layers of *raupo* tied down with flax."

A similar float to the above, made of reeds, is still used in Mesopotamia. (See fig. 99.)

The leaf of the *raupo* (*Typha angustifolia*) is remarkably light and buoyant when dry, but gradually becomes water-logged when immersed in water.

Polack, an early trader at the Bay of Islands, wrote as follows: "Among the early occupants of New Zealand, canoes were entirely made of the bulrush. We have seen some of these vessels of olden times, nearly sixty feet in length, capable of holding as many persons, but they are now wholly in disuse. They were remarkably thick, formed entirely of rushes, except the thwarts, and resembled the model of a canoe in every particular. They were remarkably light . . . though many bundles of rushes were consumed in forming them, and were paddled with much velocity, until saturated, when they settled down in the water. These vessels are no longer formed, and specimens are extremely rare."

Again, the same writer remarks: "On the shore, half buried in drift sand, lay an ancient canoe, made solely of the *raupo* bulrush. It was about forty feet in length, and had been neatly put together. These vessels of the olden time are not to be found in use at the present day, though a bundle of these rushes are often tied together to enable a person to cross a stream."

[*Copied by Miss E. Richardson.*

FIG. 100.—SIMPLE FORM OF MOKIHI

From *Te Ika a Maui*, by the Rev. R. Taylor.

The first remark of Polack's is likely to mislead. There is no evidence to show that rafts and floats were ever used by any people inhabiting these isles as other than makeshift conveniences for temporary use.

The above writer also refers to the small type of float used by one person, and illustrated in Taylor's *Te Ika a Maui:* "In the absence of canoes, a quantity of dried bulrushes are fastened together, on which the native is enabled to cross a stream by sitting astride and paddling with his hands . . They are extremely buoyant, and resist saturation for a long period." (See fig. 100.)

In the Auckland Museum is a *mokihi* 11 ft. or 12 ft. long, and constructed of *raupo*, or bulrush-leaves, lashed in thick masses on to a canoe-shaped frame made of *kareao* (pliant stems of a climbing-plant), the interior being filled with *raupo* up to within 4 in. or 5 in. of the top of the sides.

The Rev. J. A. Wilson speaks, in his *Missionary Life in New Zealand*, of using one of the small *mokihi* that the navigator sat astride on: "You sit as on horseback; the

legs dangling on each side in the water act as ballast; the *moki* being very light, it requires great steadiness in the person who bestrides it to prevent a mishap."

Wakefield tells the following: "We descended the [Pelorus] river in company with four or five canoes, in which they [natives] stowed themselves, with their women and children, cats, dogs, and pet sucking-pigs, who all took their places among the baskets of flax and potatoes, and seemed as much at home when shooting a ticklish rapid as on shore. One boy of twelve years old made himself a canoe of two bundles of soft bulrushes, called *raupo*, which he bound together with flax, and guided with great dexterity from his perch in the middle."

Bishop Selwyn relates that when travelling on foot through the Roto-rua and Taupo districts he carried an air-bed, which he frequently used as a raft in crossing rivers, and also sometimes in traversing them. The bed, having been inflated, was placed on a framework of sticks constructed by his native companions. It was thus used by two natives whereon to descend a part of the upper Whanga-nui, somewhere about Taumaru-nui.

The Tasmanians used a rude float made of a number of strips of bark tied together into a long bundle pointed at both ends. Californian Indians used a similar float made

[*Sketch by Miss E. Richardson.*

FIG. 101.—MODEL OF A MOKIHI FLOAT MADE BY A NATIVE.

The prow and stern-piece were not a feature of these floats.

of rushes, and in ancient Egypt a double-pointed float of bark was employed. In modern times such primitive contrivances, made of straw or stalks, have been seen on the upper Nile, where the natives sit astride them, propelling them with their legs or a double-bladed paddle. The Australians made a rude float of bark or rushes like those of the Tasmanians.

The log raft (*balsa*) seems to have been used on the west coast of South America from Paita northward to Darien. (See fig. 102, p. 142.) Some are said to have been 70 ft. long and 20 ft. wide. Lacking a keel, a rude form of centre-board was made use of by means of thrusting planks down between the logs. This had a considerable effect on the navigation of these rude craft, and is a curious illustration of advancement from most primitive conditions. On the other hand, these folk had not grasped the idea of the built-up raft, by which resistance to the water is so much lessened, as in constructing a platform on the top of two parallel logs, though they employed sails. At page 274 of volume 1 of the *Journal of the Polynesian Society* occurs the following: "The group now known as the Galapagos Islands was discovered by an Inca of Peru named Tupac Yupanqui, who

flourished towards the end of the fifteenth century, and was the grandfather of Atahualpa. . . . After the conquest of Quito, he collected a large fleet of *balsas* on the coast of the Province of Manta, put to sea, and discovered the islands."

An illustration of one of these log rafts in the account of Spilbergen's voyage of 1615 shows one with two triangular sails, but the square sail was introduced later. On

[*Sketch by Miss E. Richardson.*

FIG. 102.—THE BALSA FORM OF RAFT OF SOUTH AMERICA. (See p. 141.)

Showing lee-boards and square sail.

Lake Titicaca the natives construct floats or rude boats of reeds resembling the *mokihi* described by Brunner. A description of the Peruvian log rafts and the use of lee-boards may be found in Morrell's Voyages.

In the account of the voyage of Francisco de Ulloa, in the year 1540, is a brief description of log rafts seen on the coast of Lower California: "The canoes of these

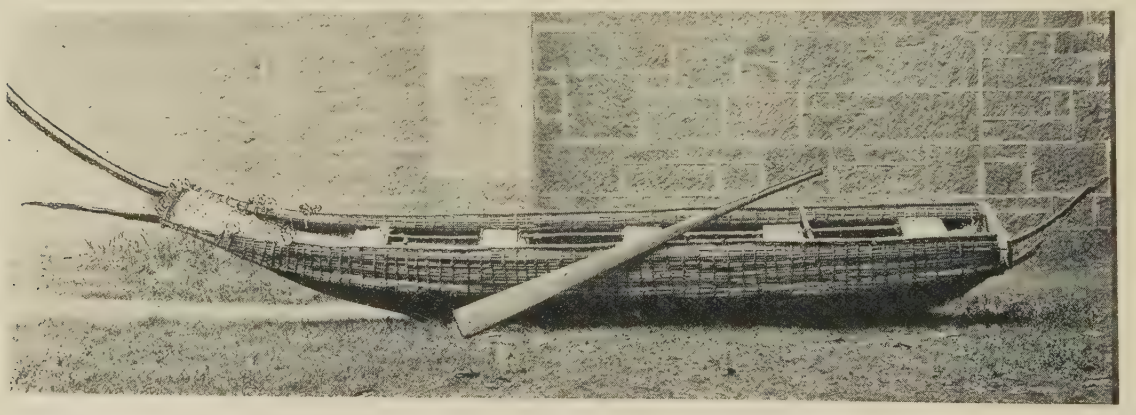


FIG. 103.—THE WAKA PUHARA, OR REED FLOAT, OF THE CHATHAM ISLES.

Specimen in Canterbury Museum, Christchurch.

Indians were made of the trunks of cedars, not hollowed, but merely fastened parallel and close to each other. Some of these trunks were twice the thickness of a man, and six yards in length."

Swimming-powers of the Polynesians.—This is not the place to describe the astonishing powers of the Polynesian as a swimmer, but his being so much at home in the water has

ever been to him one of his most useful accomplishments—as, for instance, in the case of capsized or swamped canoes. La Perouse remarked of the natives of Easter Island: "They swim so well that they will leave the shore to the distance of two leagues in the roughest sea, and by preference, for the sake of pleasure, land on their return at the place where the surf beats the strongest."

Canoes of the Chatham Isles.

The Moriori folk, natives of the Chatham Isles, possessed no timber from which they could hew out canoes, hence they were compelled to construct rude craft composed of flax-stalks, fern-stalks, and seaweed built up on a timber keel. The following notes on these primitive craft, which were but little more than floats, were obtained by the late Mr. A. Shand.

1. The *waka puhara*, or *korari*, had two keels (poles or small beams); thus it was flat-bottomed. The stern-post was called a *koua*, and carved, and the two pieces of wood projecting from the stern were called the *puremu*, and were also carved. The bottom and sides were formed of dry flowering-stalks (*korari*) of *Phormium tenax* lashed to a slight wooden framework. Through these materials, of course, the water passed freely, thus the so-called canoe was always full of water—*i.e.*, full so far as it was sunk in the water. These craft were made up to 30 ft. or 35 ft. in length, 4 ft. wide, and 4 ft. deep. (See figs. 103, 104, 105, 106, pp. 141, 145, 146, 147.)

2. The *waka rimu*. This was a vessel much the same as No. 1, but sides and bottom were covered only with pieces of *rimurapa*, or bull-kelp. Deighton states that the frame was so covered both outside and inside.

3. The *waka pahi* was a deep-water vessel, used in making trips to the outlying islands. It was built up on two keels of *matipou* wood, about 30 ft. in length in the case of the largest specimens. Of such the *koua*, or stern-pieces, of *akeake* wood would be about 12 ft. high, while the *puremu* projected about 10 ft.; width about 8 ft., and depth about 5 ft. The *rimurapa*, or kelp, was used in its construction, as in the case of the *waka rimu*.

4. The *waka ra* was made of bracken-stems (*Pteris*) and the dry flower-stalks of *Phormium*, in much the same form as a Maori *mokihi*. The sides were low, and apparently this craft was used only in a ceremonial manner. Rude images of men, from twelve to twenty-four in number, were placed in it, each with a paddle tied to its hands, and the rude vessel with its singular freight was set adrift upon the ocean. One authority states that it was so launched from the place on the eastern side of the main island where a cave is seen, at a time when a westerly wind was blowing. It was from that cave that spirits of the dead were believed to depart on their journey to the spirit-world. This curious act is said to have been equivalent to a propitiation of Rongo-takuiti, who represented seals and blackfish; it amounted to a request that that being send the people an abundance of such food-supplies. Civilized man depends principally upon spoken prayers, but uncultured man sometimes prefers to act his requests.

The following remarks on canoes of the Chatham Isles are from the late Mr. Shand's monograph on the Moriori people, published as volume 2 of the *Memoirs of the Polynesian Society*: "In the matter of canoes the Moriori differed essentially from all other branches of the race; in fact, they possessed none, properly so called, but used a kind of built-up craft, very clumsy, especially for pulling, but otherwise very safe so long as the fastenings were sound. In heavy weather they were not liable to fill and capsize like a Maori canoe, being really, from their construction, more rafts than canoes. Their sea-going ancestors from far Hawaiki would have scorned the use of such a vessel, and certainly could not have undertaken a distant voyage in one; the material of which they were composed would not have held out. On the other hand, considerable ingenuity was shown in utilizing such unpromising material as they were possessed of. The absence of canoes arose from the fact that the islands possessed no timber of a sufficient size

and quality to make canoes from. The flooring of their rafts was made of *korari*, the flower-stalks of *Phormium tenax*, with kelp placed in the crate-like frame beneath, to render the vessel buoyant. The kelp was of the large broad-leaved kind, and was inflated with air; it was taken out on landing, dried, and reinflated as before. Notwithstanding the flimsy character of these vessels, the people were accustomed to cross from Chatham Island to Pitt Island, a rough sea strait of twelve miles in width, and to undertake far more dangerous voyages to the small off-lying islands, some of which are fifteen to twenty miles away from the main island, although closer to Pitt Island. It very often happened, however, that these raft-canoes and their crews were caught in a storm and were carried out to sea, there to perish. They were large enough to carry sixty to seventy people, and were propelled by paddles (*hiwa*), which, contrary to the method of all other Polynesians, were used by the crews sitting with their backs to the bows, as with Europeans, and by making use of a support, or thole-pin, against which the paddle worked. They carried fire with them for warmth, which was placed on stones and earth on the floor of the raft-canoe. Their raft-canoes never had sails. The larger and sea-going ones were called *waka pahii*, or *pepe*."

The account of the canoes of the Chatham Isles furnished by Lieutenant Broughton, the discoverer of the group, is as follows: "The canoes we examined were more in form of a small handbarrow without legs than anything to which they can be compared, decreasing in width from the after to the fore part. They were made of a light substance resembling bamboo, though not hollow, placed fore and aft on each side, and secured together by pieces of the same wood, up and down, very neatly fastened with the fibres of some plant in the manner of basketwork. Their bottoms, flat, and constructed in the same way, were two feet deep and eighteen inches in breadth; the openings of the seams on the inside and bottom were stuffed with long seaweed; their sides meet not abaft, nor forward; their extreme breadth aft is three, and forward two feet; length, eight and nine feet. In the stern is a seat very neatly made of the same material, which is movable. They appeared calculated alone for fishing amongst the rocks near the shore; were capable of carrying two or three persons, and were so light that two men could convey them anywhere with ease, and one could haul them into safety on the beach. Their grapnels were stones, and the ropes to which these were made fast were formed of matting, worked up in a similar way with that which is called French sinnet. The paddles were of hard wood, the blades very broad, and gradually increasing from the handle."

Evidently this voyager did not see any of their larger vessels, such as are described above.

The following account of the so-called canoes of the Moriori folk is taken from the journal of the "Chatham," published in volume 2 of McNab's *Historical Records of New Zealand:* "Here we found two canoes, if they may be allowed that name, for so little did they resemble anything we knew of that kind that had they been found inland instead of on the sea-beach I believe we should have thought of various other uses before we had hit on the one for which they were really intended. In shape they were not unlike the body of a common wheelbarrow; their sides were made of small sticks lashed tightly with withs [withes] upon one another about eight or nine feet long. The widest end about three feet, the other about two, and narrowing downwards, left a flat bottom better than a foot broad. Their depth was nearly two feet, and compactly filled with seaweed almost to the top. The paddles were a rough piece of wood rudely made into a flat form without the least neatness. The whole of their construction made it pretty evident that they were most probably used merely in the bays and amongst the rocks for fishing."

Two of the small Moriori craft, such as were used by one person for fishing purposes, have been preserved in the Dominion Museum. As these rude vessels are formed of materials that are already yielding to decay, it has been thought advisable to record some description of them, as also illustrations.

In fig. 104 we see the better of these two specimens, the other one not being complete. The former shows a very primitive craft that might be better described as a float than a canoe. The term "catamaran" has been applied to these vessels by some, but, as it is also applied to log rafts and to outrigger canoes, the name is not of much service to us. The length of this specimen is 9 ft., which does not include the projecting ends of the keel-pieces. At 20 in. from the stern end is the deepest part of the craft, 18 in. (outside measurement), which includes the projecting keel-pieces. From this point the stern sweeps upward, and the depth also decreases toward the prow, the keels rising gradually to the prow in a slightly curved sweep from the middle sections of the two keels.

The frame consists principally of two keel timbers of small dimensions, 10 ft. 3 in. in length over all, each composed of four pieces, and placed parallel to each other. These are the only two timbers that possess any strength, and that is impaired by their three joinings. The balance of the frame is composed of rods about 1 in. in thickness, and of slight supplejack canes. The main piece of each keel is that forming the lowest (or central) part; it is 4 ft. 5 in. long, its upper surface $1\frac{1}{4}$ in. to $1\frac{1}{2}$ in. thick, but narrowing to $\frac{1}{2}$ in. at the bottom. The stern-piece is 31 in. long, and curved; it is fitted to the upper part

Fig. 104.—A Waka Puhara of the Chatham Isles, in Dominion Museum.

of the lower piece with a scarf and slight shoulder. In form it resembles the lower piece, but narrows somewhat toward the upper end, where it projects 7 in. from the body of the craft.

The upward sweep of the forward ends of the two keel-stringers is formed, in each case, of two pieces. The lower piece or section is 3 ft. 8 in. long, and is curved, its lower end scarfed and fitted on to the horizontal central piece, the scarf being 8 in. long and carrying a shallow $\frac{1}{2}$ in. shoulder. This piece decreases in width and thickness upwards towards the prow, and its under part is brought to a sharp edge, unlike the other two already described. The last and smallest piece of the keel is but 21 in. long, and it decreases in size in sympathy with the lower part, to terminate in a point projecting 9 in. from the forward end of the vessel. These four pieces forming each of the slight keel-pieces are lashed together, the lashing-material being cords of *Phormium* fibre passed through holes bored in both pieces, and also the toe of each scarf. The extreme ends of both keel-pieces are rudely carved, those projecting from the stern showing no particular design. (See fig. 105, p. 146.) One prow projection has been broken, but the other is carved into a fair representation of the head of a bird, reminding the observer of certain Melanesian carvings, but which is not a Maori form.

The two keel-pieces are thus shown to be alike; they are 11 in. apart at the prow, and this space decreases gradually to 8 in. or 9 in. at the stern. On this foundation the slight

framework of the sides is built up, consisting of small ribs and two fore-and-aft rods on each side. There are seventy-six slender supplejack ribs—pieces of the pliant, tough stem of a climbing-plant (*Rhipogonum scandens*)—placed about 1 in. apart. These form the bottom of the craft, and are laid across on the upper surfaces of the two keel-pieces and bent sharply upwards at the outer edge of the keels to form side ribs. The upper ends of these are tied to fore-and-aft rods extending from the stern-board to within 28 in. of the forward end of the keels. To hold the floor-ribs in place, and attach them to the keels, three pieces of supplejack are laid fore-and-aft on them, one along the middle and one over each keel. These are tied to each rib, and the side ones are also lashed to the keels, at intervals of from $3\frac{1}{2}$ in. to 6 in., the lashings passing through holes cut (with a steel chisel in this case) in the keels.

Here we have the framework of the craft; but the sides have been raised 8 in. by fixing two more rods, $\frac{3}{4}$ in. to 1 in. in thickness, fore-and-aft, extending from the upper

Fig. 105.—Stern End of the Rude Moriori Craft shown in Fig. 104.

part of the small horizontal stern-board to within 27 in. of the prow end of the keels, where an angle occurs, and two short rods meet the two long ones. Between the two side rods, 8 in. apart, are lashed horizontally small bundles of dried stalks of fern (*Pteris*), through which pass vertically short sticks which are lashed to the rods and so form a continuation of the main or lower side ribs. Why the latter should not have been continued to the upper side rod, and so saved the trouble of inserting so many short pieces, is by no means clear. On the outer sides of these short ribs are lashed other small bundles of fern-stalks, which extend to and cover the lower side rods, below which the longer supplejack ribs are exposed, and carry no lining.

The whole fabric is braced by short cross-sticks placed about $1\frac{1}{2}$ in. apart and tied to the sides. This grating-like structure is 8 in. below the top of the sides in the middle of the craft, which decreases to zero at the prow end, and to 4 in. at the stern end, which is closed by a piece of board. The width of this rude vessel across the top is 20 in. in the middle, 18 in. at the stern, and 16 in. at the prow. The whole space between the

grating or cross-rods and the bottom is closely packed with fern-stalks and dry flower-stalks of *Phormium*. All lashings are neatly made with strips of *Phormium* leaf, except those of the keels, where plaited cords are used. Four pegs, 16 in. long, pointed at the lower end, have been thrust diagonally into the massed packing under the grating, their upper ends projecting above the upper side rod, to which they are tied.

Evidently this craft was meant to hold one person, who sat at the stern. At this end is an open space of 30 in., forward of which a curious and detachable apparatus is seen. It looks like a diminutive but unfinished platform, possibly used to put things on. Two rods, 6 ft. long, are placed 9 in. apart within the vessel between the topsides. Their forward ends rest on the upturned prow, and they are otherwise supported by six pegs, sharp-pointed, and thrust down into the packing beneath the grating or floor. On the top of these parallel rods three diminutive platforms have been formed, each about 11 in. by 12 in. in size, by tying short cross-pieces of *Phormium* flower-stalk (*korari*) on to the rods. It will be seen that the blocked packing is to gain additional buoyancy, and that the water would wash freely through the whole structure.

In fig. 106 we have a similar specimen of the rude Moriori craft, of which the keels are made up of three pieces. It lacks the packing or filling of buoyant materials in the hold, below the grating or cross-pieces. The length of this float is 8 ft. 7 in.; depth of interior

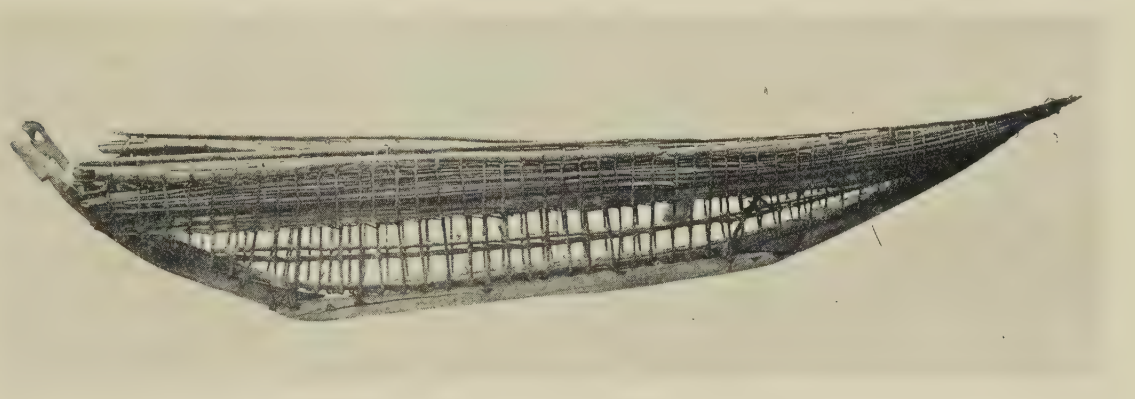


Fig. 106.—A Waka Puhara of the Chatham Isles.

is 17 in. at the deepest part, which is at 26 in. from the stern end, from which point the stern rises, and, towards the prow, the flat bottom ascends gradually, as shown in the illustration. The two keel-pieces, or light stringers, are of the same form as those of the specimen already described; the three pieces of which they are composed are fastened together in the same manner, but they do not project at the prow, their ends being covered with small cross-pieces of split supplejack tied on them. The whole fabric is of very similar construction to fig. 104, except that three horizontal side rods are used, and the bent supplejacks forming the ribs are carried up to the gunwales, so that no short supplementary pieces are employed as in the other craft. The absence of packing below the cross-pieces or grating allow of the details of construction being better seen in fig. 106.

The upturned prow is lined with stalks of fern and *Phormium*, and the upper parts of the sides are finished off as in fig. 104. In the stern is a small movable seat made by tying short pieces of fern-stalk on to three cross-rods. A similar but smaller contrivance near the prow is but 6 in. wide. No form of outrigger was used by the Moriori on these frail craft, and it is probable that when in use the water-logged bodies sank deep enough to prevent a capsize.

When the ancestors of the Moriori folk of the Chatham Isles made the voyage from New Zealand to that group they did so in large seaworthy canoes, as is shown in tradition. At the Chathams they found no timber large enough to make canoe-hulls.

During the seven hundred years or thereabouts that these folk occupied the Chathams they evolved the frail craft we have described—an illustration of how new forms may be invented under the stern law of necessity.

Although the Moriori used no form of double canoe, yet they seem to have preserved in tradition a dim knowledge of them as known when their ancestors lived in New Zealand or elsewhere. Some interesting traditions of the voyage of the immigrants to the Chathams are contained in volume 2 of the *Memoirs of the Polynesian Society*.

The following notes applying to one of the raft-canoes described above have come to light: they were written by the late Mr. A. Shand in 1889:—

"The model is one of the large sea-going canoes which were used to go from Chatham to Pitt and the various outlying islands—to the latter to get fur-seals for clothing, and the young of various seabirds before they were quite ready to fly, as well as for going out to fish round the coast. Owing to the lack of suitable timber on the island to make anything like a Maori canoe, they devised and made this raft-canoe, if it may be so termed, capable of carrying fifty or more, stuffing the inside with large bladders of blown-out kelp, which were taken out on landing at their destination, to be dried for future use.

"As will be perceived, the water washing through the body of the canoe made progress rather slow; but, being skilful and daring navigators, they took advantage of the tides, which run very strongly round the coast, such carrying them generally in close proximity to their destination. Further, they say that, owing to their peculiar construction, these boats were safer in rough weather than a Maori canoe or a whale-boat—not shipping water, or, when spray came over, it ran off without doing mischief; and requiring a very heavy gale to capsize them. In going to a distance they plaited large baskets (*kona*), which they filled with earth, on which to light a fire and cook food, taking also a large supply of firewood with them, as well as drinking-water. Everything being tied necessitated their taking lashing-materials with them wherewith to make necessary repairs. The paddles were used oar-fashion against projecting pins, while at the stern two or three steersmen, according to the size of the canoe, sat directing others with such commands as '*To tu*,' '*To waho*,' '*Here ka raro*'—this more especially when landing on surf beaches. The large sea-going canoes were called *waka pahi*."

Ceremonial Matters pertaining to Canoes.

Mauri.

Each vessel that came from Polynesia to these isles seems to have had on board some sort of talisman, a *mauri*, *ara*, or *mawe*, looked upon as a sacred object endowed with protective powers, and which brought good luck to the vessel and its occupants. These items seem to have served a similar purpose after the arrival on these shores, probably for many generations.

In the case of the "Arawa," which came to these isles about five hundred years ago, a *tapu* stone called *ara* was brought, and was deposited on Passage Rock, or Takapou, an island south-west of Cape Colville. When Ngatoro, the priestly adept, so deposited it, he addressed it as follows: "Thou art left here O stone! to be embodied in the ritual of the descendants of the people on this vessel, as a *mauri* for the invocations to ward off evil." An account of this incident may be seen in volume 2 of the *Journal of the Polynesian Society*, pages 234, 235.

Tarakawa states that the *mawe* of the "Matatua" vessel that came hither from Polynesia was a similar item to the *ara* brought by the "Arawa" canoe, and speaks of it as though it represented the course of the vessel hitherward, in which case it is the common word *ara*—a path or track, or means of conveyance (both vowels short). If it is the Tahitian word *ara* (the name of a hard black stone), then it is the Maori

kara, a black basaltic stone. The natives of Tahiti have dropped the *k* and *ng* since the Maori left those parts.

In volume 20 of the *Journal of the Polynesian Society*, page 188, Tarakawa speaks of some sacred stones that were brought to New Zealand in the "Arawa" and "Tainui" vessels, but the account is a very unsatisfactory one.

Tamahau, of Wai-rarapa, remarked that the above *ara* seems to be identical with what his tribe terms a *kaha*, which was a piece of seaweed-stem which had been carefully dried after preparation in a steam-oven, and over which a priest had recited certain charms. No canoe ever went on a voyage without taking this *kaha* with it carefully deposited in the bows, and on returning it was carefully replaced on the *tuahu*, or *tapu* place, where it was kept. The *kaha* was very *tapu*, and no woman was allowed to touch it. Its use was as a talisman to ward off evil.

The following notes on the *mauri* of a canoe were contributed by Tuta Nihoniho, of Ngati-Porou, an east coast tribe :—

The *mauri* of a canoe was usually a small stone, over which a qualified *tohunga* (priest) had recited a charm or invocation in order to endow it with certain powers as

Fig. 107.—Stone Mauri, or Talismanic Symbols.

These serve as abiding-places or shrines for supernatural beings in whose charge lands, forests, houses, canoes, &c., were placed.

a medium between the canoe and the gods, without whose care and assistance no canoe, house, land, forest, or person can prosper. This *mauri* was also taken out to sea once in the canoe that it represented, where it had another such ceremony performed over it, after which it was returned to the land and carefully concealed by the *tohunga* caretaker at some secret place where it was judged to be safe from observation, often under the roots, or in a crevice at the base, of some tree. This material medium influenced the gods to protect the vessel from the dangers of the ocean (where Tawhirimatea ever wages war against Tane). It also had an effect in causing fish to be plentiful and easily caught—"*Kia ngawari nga ika*," as my informant quaintly put it—to render the fish accommodating, complacent.

The more important canoes, such as war-canoes, and deep-sea-fishing canoes, were provided with *mauri*, but not the smaller craft, such as river-canoes.

If a *mauri* happened to be found by a person hostile to the owners of the canoe, he would bear it off and perform a ceremony over it in order to nullify its powers and render it worthless. This would spell disaster to the owners of the vessel, even if such enemy did not also perform an act of *makutu*, or black magic, by means of

which to injure them, simply because it left the canoe utterly defenceless against the hostility of Tawhiri-matea (personified form of gales) and either the anger or neglect of the gods, whose medium and shrine, the material *mauri*, had been contaminated and polluted. For the pollution of *tapu* must necessarily be followed by either the anger or neglect of the gods.

It would also appear that should a *mauri* be found and removed by some person who did not perform any ceremony or repeat any charm to destroy its powers, such act would still nullify or vitiate the powers and properties of the medium; hence the *tohunga* would discard it and seek another suitable stone to take its place, which stone he would render *tapu* and endow with necessary powers even as he did the former one. For the canoe, house, forest, subtribe, fish-weir, or whatever a *mauri* represents *must not be left defenceless*—that is to say, deprived of the protection and care of the gods.

This curious phase of mentality can scarcely be grasped by us, who, as we advance in general culture, most certainly place less and less reliance upon supernatural beings and their powers. But such beliefs are common among more primitive folk, and, of all men, none were more religious than the old-time Maori—or superstitious—call it which you will.

Mouri is sometimes used as a variant form of the word *mauri*, and the non-material *mauri* is rendered by some as "spirit, soul"; the material *mauri* of persons is quite a different item, and may be compared to the material *mauri* of a canoe, forest, &c.

Te Ahi o Hurihanga.

Tuta Nihoniho informs me that in former times, when a party was about to start out on a war expedition by canoe, a curious ceremony was performed by *tohunga*, in which a sacred fire known by the above name was kindled. This rite included the recital of certain charms or invocations, which were supposed to have the effect of causing misfortunes to afflict the enemy, and of bringing good luck to the war-canoes and their occupants.

Canoes under Tapu.

All canoes engaged in war expeditions were under *tapu*, and no food could be cooked or eaten in them. Tuta remarks on this subject, "No cooking was done on board a *tapu* canoe, but preserved foods [dried], ready for eating, and water, were often carried thereon. Of course, only some canoes were *tapu*—not all."

"They must not put cooked food into their war-canoes, eat or spit while afloat, or even have any fire in them, or smoke their pipes, which must certainly be a severe exercise to their faith."—(*Life of Henry Williams.*)

An old man of Ngapuhi, in describing a southern raid in which he took part, said: "As we travelled along the coast in our canoes, no cooked food was allowed to be carried thereon, nor was fire carried, nor was any man allowed to partake of food on board." Polack writes: "No food may be eaten in a canoe when paddling in the vicinity of a sacred spot." The Rev. R. Taylor says, in *Te Ika a Maui*, "If a corpse was conveyed in a canoe, it was never afterwards used, but painted red and drawn on shore."

In describing native customs the Rev. Mr. Yate remarks: "The person who consults the oracle always carries the sticks with him to the battle; and should the expedition move by water he has a canoe, which is strictly *tapu*, and into which no food is allowed to be put."

The vessels by which the ancestors of the Maori came to New Zealand were rendered *tapu* by the ritual that had been performed over them, by the *tapu* objects brought in them, and by the *tapu* priestly adepts, conservers of *tapu* ritual, who came in them. Some brought certain objects representing gods. In the legend of Honoura,

preserved at Tahiti, we read that "Oro and other gods of the highest order were never exposed to view; they were kept in numerous wrappings, encased in the bows of their canoes, and their priests represented them among the people."

When a canoe was specially made or used for the purpose of avenging a murder or defeat it was known as a *waka mamae* or *waka takataki mate*. The following extract is from the *Life of Henry Williams:* "January 18, 1832. The natives very apprehensive

FIG. 108.—PART OF CANOE USED AS A CENOTAPH. (See p. 152.)

that Tareha would return to the Bay of Islands, as he had not yet joined the main body, and was in a large canoe with no other persons, except three of his wives to pull her along. The canoe was *tapu*, having conveyed the body of Hengi, the principal chief killed at Korora-reka, to his former place, and was now to be taken to the place where his sons were killed, for the purpose of being broken up and burnt, and was consequently termed *waka mamae*. There are very many things, such as garments, war

instruments, paddles, &c., amongst the different tribes now going up, which are on their way for the purpose of being, I think I may say, offered up to the *manes* of the dead. . . The canoe was a *waka tapu;* but its more specific designation, when employed on an errand of revenge, was *waka mamae.* A canoe so called would sometimes be built to keep in memory a grief and the duty of revenge."

The following passage from the same work illustrates the use of a somewhat similar expression: "Mokà fired a number of rounds from his great guns here, termed *paura mamae,* which he expended because this was the place where he received his wound."

Again, under date 4th January, 1836, in *The Life of Henry Williams* occurs the following: "Ngapuhi announced: they did not hurry, but all came after waiting two hours, and fired off between two and three hundred cartridges (*paura mamae*) for Kati and Toha. Rewa afterwards burnt a fowling-piece for the same cause. They then assembled round Toha and had a long *tangi* [wailing]."

Waka takitaki mate.—When Te Umu-ariki, a chief of the Tuhoe Tribe, was slain at Turihaua, on the east coast, his tribesmen assembled at Te Waimana in order to make

[*Sketch by Miss E. Richardson.*

FIG. 109.—A FORM OF COFFIN FASHIONED FROM PORTIONS OF A CANOE. (See p. 152.)

From *Te Ika a Maui,* by Rev. R. Taylor.

a war-canoe to convey an avenging party to square the account. The vessel was finished, named the "Totara o Huiarau," and taken to Whakatane, where Paora Kingi, a leading chief of Tuhoe, said, "We have now finished our canoe, and all is ready to set forth on the errand of revenge. We will let it end here. No more blood shall flow, and I will go and make peace with our enemies"—which he did.

Mr. White has preserved a tradition, related by an old native of the Ngapuhi Tribe in 1839, that some of the canoes that came hither from Hawaiki were so extremely *tapu* that they were provided with tenders (*waka haumi*) to carry the necessary food-supplies.

We have already seen that at the death of a person of rank his canoe might be destroyed and one-half of it set up by sinking the wide end in the earth, as a cenotaph or mortuary memorial. (See fig. 108, p. 151.) Such a monument would be adorned with painted or carved designs. Old Wellington settlers will remember such a cenotaph, erected to the memory of the Ngati-Awa chief Te Whare-pouri, that formerly stood

on the hillside above Wallace's Inn at Nga Uranga, below the fort. This canoe was named "Te Wheke a Muturangi." It had been captured in the fight known as Whaka-pae-tai, that occurred at Waiorua, Kapiti Island, when local tribes attacked the invaders from the north early in the eighteenth century. (See *Journal of the Polynesian Society*, vol. 10, page 162.)

Coffins for containing bodies of the dead were occasionally made from two pieces of a canoe, and some of the coffins made for containing bones of the dead after exhumation were shaped like a canoe. In Cruise's *Ten Months' Residence in New Zealand*, published in 1823, we note the following: "We . . . entered the burying-ground. In the centre of the enclosure stood a kind of stage, roofed over like a house, and on it were laid several small canoes. In one were the remains of a child, rolled up in a mat, but they were not quite decayed; and in another was a heap of bones, with a skull placed upon the top of it." (See fig. 109, p. 152.)

In describing a *wahi tapu*, or sacred place, seen by him in the Kawhia district, Angas says: "A little canoe, with sail and paddles, was also placed there to serve as a ferry-boat for the spirit to enter in safety into the eternal abodes." It is very doubtful if such was the object; such was not a Maori custom and illustrated no Maori belief. It was probably a toy belonging to the dead child.

Mr. John White, in describing the contents of a burial-cave examined by him in the north, remarks that in the cave "was built a small house of the swamp-reed, ornamented with flax of variegated colours, in which were the bones of *ariki* of the tribe. At the doorway of the house, which measured altogether not more than about five feet by three, were the bones of a child, and near them a small canoe, his plaything, had been taken with him to his long rest." Frail toy canoes were also made of bulrush-leaves by, or for, children.

In his remarks on "Ceremonies for the Dead" Shortland states that during such rites "A carved chest, ornamented with feathers, is made, also a carved canoe, a small one resembling a large canoe, which is painted with *kokowai* [red ochre]. . . The carved chest is called *whare rangi*." He explains that the garments in which the corpse was arrayed were placed in the carved chest, which is preserved by the family and descendants as a sacred relic. He omits to state that the so-called carved box was elevated on the top of a high post, and also to say what was done with the little canoe.

Shortland has another item pertaining to miniature canoes: "Meanwhile Kahu was on the beach . . . busied about sending off a canoe with food for the *atua* (gods) at Hawaiki, and for Hou-mai-tahiti, food both cooked and uncooked. This canoe was made of *raupo* (a species of bulrush). There was no one on the canoe, only stones to represent men."

Archdeacon Walsh gives an account of a curious ceremony formerly performed at Mokoia, the island in Lake Rotorua, the day before the planting of the sweet-potato crop commenced. The priestly adept made a little canoe-shaped vessel of dry bulrush-leaves, put a few of the tubers in it, presented or placed it before the stone image representing the god of the tuber, and then set it adrift on the lake. This was done for the purpose of securing a good crop, as the offering was supposed to find its way to Hawaiki, the far-distant fatherland, and to the gods of that land—the land whereat the *kumara* originated.

The Awa Moana *Rite.*

The following account of a ceremony performed ere commencing a voyage was collected by Mr. John White:—

When the people had taken their places in the canoe, the man officiating as *tohunga*, or adept, took off his clothing, and wrapped some seaweed round his body to

serve as an apron. He then took a piece of seaweed in each hand, and, facing toward the east, he stood erect and repeated the following:—

Ka hura tangata uta
Te tiaki atu ki tangata tai
Ka hura tangata tai
Te tiaki atu ki tangata uta.
Pera hoki ra te korepe nui, te korepe roa
Te wahi awa, te totoe awa
Whakamoe ko Tu, ko Rongo
Te tama i a ia te awa me ko wai
Kauraka tama e puritia
Tukua atu tama kia puta i waho i te tawhangawhanga
He putanga ariki no Rongo
Ki te ata tauira maiea
Ki taketake nui o Kahukura
He moana i rokia.

He recited this aloud as he stood waving the seaweed before him. He then cast the weed into the sea, saying—

Tena te mau, ko te mau tapu a te aitu
A te tipua tawhito a Tangaroa.

He then pulled the seaweed from his body, and again clothed himself, his garments having been left some distance away from where he performed the ceremony. This ceremonial performance was for the purpose of rendering the ocean calm, but is here abbreviated.

The same authority gave the following: When a canoe is overtaken at sea by a storm, or the sea chances to be rough, the adept of the party recites the following charm:—

Ei, tena te ara, te ara ka iri
Ko te ara o Tane
Tane i te pu, Tane i te tamore
I tupu mai ai to whanau ariki, e Tane!

Then a *hirihiri* charm was repeated—

Kotahi ki reira, kotahi ki a (Mea)

naming in this manner the various *tohunga* (priestly adepts) of standing of the tribe. On reaching land the adept procured two *kakaho*, or flower-stalks of *toetoe* (*Arundo conspicua*), one of which he cast into the sea as a dart is thrown, and the other he chewed or bit the end off. This freed the party from *tapu*, and the members thereof could partake of food.

There was often a considerable amount of ceremonial observance connected with a new *waka taua*, especially in the event of such a vessel having been constructed for a special and important occasion, such as an expedition to avenge a slain tribesman.

In the legend of Rata, brought from Polynesia by the ancestors of the Maori, we may note the advice given to Rata by his mother on the completion of his new canoe: "Carry the *ahua* [semblance, personality] of your canoe to your elder, that he may perform the *kawa* ritual over it, and name it, also charm the course of your canoe and teach you the charms by means of which you may bring to your assistance the monsters of the deep, who will bear your vessel onward in such manner that no enemy may overtake you; likewise the charms whereby you may call on the offspring of Rongo-huakai."

Herein we note the curious practice of performing ceremonial rites over the *ahua*, or semblance of some object—a common occurrence in former times, and one which the writer has seen practised within the past few years among the Tuhoe Tribe.

The charms recited in order to expedite the passage of a canoe, to remove obstructions and dangers, to calm the waters, are termed *awa moana*, and their action is expressed by the term *hoa*. As Rata's adviser put it, "*Kia hoaia te ara o to waka.*" *Ara* and *awa* denote the path or course of a vessel across the ocean.

The monsters of the deep referred to are various species of whales, which are said to have guarded and assisted the vessels of old-time voyagers when called upon by responsible persons. The offspring of Rongo-huakai are four man-eating species of shark (*mango*), known as *au-pounamu*, *huri taniwha*, *makomako*, and *waha-tara*.

Further advice given to Rata was: "Let your voyage be commenced in the month Akaaka-nui, when Marewa and Autahi [stars] are hanging above the horizon, that you may experience a long continuance of the fair weather of Matariki." (*Te paki o Matariki* = the fair weather of the Pleiades.)

Prior to the departure of the expedition of eight vessels, the canoe of Rata, the leader, was hauled ashore and up to the *turuma* (latrine) of the village, where the priestly adept Whakaiho-rangi performed certain ceremonies over it and recited all necessary ritual to ensure the welfare of the vessels and their occupants, the fleet being represented by "Aniuwaru," the outrigger canoe of Rata. The following is one of the ritual chants recited on that occasion:—

Tau ake nei au i taku nei tau
He tau tika, he tau aronui
He tau matua, he tau tipua, he tau arorangi
He tau ka wheau mai nou, e Ruatau! E Aitupawa . . . e . . . i!
Tu-matauenga tau tika mai ki tenei uriuri
No Rangi nui tamaku rangi . . . e . . . i.
Tenei ka tau, ka tau ki tenei pia
Ki tenei tama na Tane nui a rangi . . . e . . . i.
Tau ake nei au i taku nei tau
He tau tika, he tau aronui, he tau tipua
He tau na to aro, e Tu-matauenga . . . e . . . i!
Whai ake nei au i taku nei whai
Kia tau mai nga tipua
Kia tau mai nga atua kai tipua,
Kai atua, kai tangata
Ki tenei tama nau, e Tama-kaka! E Tama-torokaha . . . e . . . i!
Tenei to ara, he ara tipua, he ara atua
He ara no o uriuri, he ara no to tama
Ko Aniuwaru kia tau tika
Kia tau atu ki tuawhenua ki Pariroa
I te pu o te tonga . . . e . . . i.
Tenei ka whakamau atu taku aro ki nga tipua
Ki nga atua kai tipua, kai atua, kai tangata
Kia ihi nuku, kia ihi rangi
Kia ihi to tinana, kia ihi o mata
Kia ihi o taringa, kia ihi o niho kai tupua
Kai atua, kai tangata
Wheau atu ai ki muri o tuaropaki rangi, o tuaropaki nuku
Ngau atu ki Tupari
Ngau atu ki Tuamatua
Ngau atu ki a Hine-one
Ngau atu ki a Hine-kirikiri
Ngau atu ki Maunga-tutumaiao
Ka tatau te po turuturu
Ka tatau atu te po tamaki rangi
Ka tatau te po ka wheau atu
Ki te po tiwha, oti atu . . . e . . . i.
Ko Rata ihi nui, ko Rata ihi roa
Ko Rata ihi tipua, ko Rata ihi atua
Ko Rata ihi tangata ki te Po

Ka wheau atu ki Rarohenga
Ki te Muriwai hou oti atu . . . e . . . i.
Hau mai to rongo he rongo tipua
He rongo atua, he rongo tangata
Ka mau te hu waiora ki nga rangi
Ka mau te hu waiora ki te wa ki tapatu o nga rangi
Ka mau te hu waiora ki te wa ki nga mata kainga
Auroki, aumoe ana mai Matuku-tangotango
Aumoe ana mai Pouhaokai
Aumoe ana mai Hine-komahi e Rata . . . e . . . i.

In this ritual chant Tu-matauenga and other gods are called upon to assist Rata in his enterprise, the avenging of his father's death, that his vessel may safely reach the far land where Matuku and Pouhaokai, the slayers of his father, dwell.

In the legend of Kupe we find the following charm recited by him in order to recover his canoe from the depths of the ocean, whither it was being dragged by a huge octopus :—

Heuea ki runga
Heuea ki tuara nui o Hinemoana
Nau, e Kiwa ! Ahua ki runga
He ihinga a rangi, he ihinga moana
Tau ake nei au ki runga te iri tu
Te iri awaawa, te iri a tai . . . e
Ki te kahu tai, ki te kahu wai nau
E Kuru-rangi . . . e . . . o.
Oi eke, oi eke, marewa, marewa
He takinga nuku, he takinga rangi
Ki tenei pia, ki tenei aro nou,
E Kiwa . . . i . . . oi.

Herein Kiwa, the Guardian of the Ocean, is appealed to for assistance.

Ko te karakia tenei o Takitumu, i tere mai ai i te moana (The ritual chanted over "Takitumu," by means of which she was enabled to cross the ocean) :—

Ko wai taku waka ?
Ko Te Puwhenua pea taku waka.
Ko wai taku waka ?
Ko te ara moana taku waka
Ko wai taku waka ?
Ko Uruhau taku waka
Ko wai taku waka ?
Ko te take o te rangi taku waka
Ko wai taku waka ?
Ko te timu o te rangi taku waka
He waka kautere nui, he waka kautere rangi
He waka atua no nga rangi taku waka
He waka tapu taku waka no nga apa rangi
No nga poutiriao taku waka
He waka tapu taku waka
No nga tawhito taku waka
He waka tapu taku waka
No Kahukura taku waka
Ko wai taku waka ?
Ko Takitumu taku waka
He waka no Hine-korako taku waka
No wai taku waka ?
No Tama-i-waho taku waka
No wai taku waka ?
No Maru taku waka
No wai taku waka ?

No Tunui-o-te-ika taku waka
He waka atua taku waka
No te ihonga nuku, no te ihonga rangi
No takere nuku, no takere haea te piere nui
Haea te piere moana, haea taku ara
Ko te ara o wai ?
Ko te ara o nga apa a rangi
Haea taku ara, ko te ara o nga tawhito
Haea taku ara, ko te ara o nga wehenga kauki
Whakahoru noa ra i te moana waipu
Haea taku ara, ko te ara o Tutara kauika
Taku ara ko te ara o Ruamano taku ara
No wai taku ara ?
No Arai-te-uru taku ara
Waerea, waerea taku ara
He ara moana taku ara
Takoto, takoto te ihu o taku waka nei
Ki roto i te awa moana o takere nui, o takere roa
Ka takoto te ihu o taku waka
I roto i te awa tai heke
Heke te tai nui, heke te tai roa
Heke te au kume, heke te au rona
Heke te au taiparipari ki whea
Pari ki tawhiti ki tiritiri o te moana tuauriuri . . . e . . . i.
Ka ea, ka ea taku waka i te ihi moana
Ka ea, ka ea taku waka i te tai nui, i te tai roa
Ka ea, ka ea taku waka i te ngaru tu, i te ngaru wharewhare
Ka ea, ka ea taku waka i te tai wharewhare i te tai maranga
Ka ea ki te ihu whenua, ki te tai uru, ki te tai marangai . . . e . . . i.
Ka whakaea, ka whakaea taku waka.
Tenei to tapuwae ko te manu ka roha, ko te manu ka tiu
Ko te manu ka whakaangi ki te ihu whenua
Ka tau taku waka, ka tau ki take whenua . . . e . . . i.
Ka tere, ka tere tenei waka, he waka no nga pia
He waka no nga taura, he waka no nga tauira
He waka no nga ariki, he waka no nga tamaroa
Ka takoto i runga i te au kume, i te au rona
I te au whakaea ki tawhiti.
Ki tiritiri o te moana ki te ihu whenua
Amohia, amohia taku waka e nga kauika o Hinemoana
Awhitia, awhitia mai nga papa o taku waka e Tutara kauika
Awhitia mai nga papa o taku waka e te wehenga kauki . . . e
Takoto, takoto taku ika taki ko Ruamano i taku waka
Takoto, takoto, e taku ika
Waerea, waerea te ara moana o taku waka
Ko koe, e Arai-te-uru, ki roto ki te awa o taku waka o Awarua
Tahia te au moana, tahia te kare moana
Tahia te huka moana ki tawhiti muri
Ki tawhiti whakaaweawe ki te hiku o taku waka.

PART V.

METHODS OF PROPULSION; ANCHORS.

CONTENTS.

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ALTHOUGH sails were employed by the Maori seafarer, yet paddling was the most common mode of propelling a canoe, while poling or punting was resorted to in ascending swift streams, and often in shoal water. The common term for a paddle is *hoe*, a far-spread name for that implement in Polynesia. Thus *hoe* denotes a paddle in the dialects of Tahiti, Hawaii, Marquesas, Mangareva, &c. At Samoa it becomes *foe;* at Tonga, *fohe;* at Rarotonga, *oe*. Another name for a paddle is *hirau*. The longer steering-paddles are called *hoe whakatere*, *hoe whakahaere*, and *urungi*. Williams gives "*Hoe piripiri*, additional steer-oar." In the Waikato district paddles with a curious curve in the handle were employed. The ordinary straight-handled kind is known as the *takaki* style. "*Waikato hoe nukenuke*" ("crooked-paddle Waikato," or "Waikato of the crooked paddles") is an old saying. (See fig. 110, p. 159.)

Tuta Nihoniho states that the *hoewai* was a broad-bladed paddle made strong in order that it might be used as both paddle and weapon.

Polack has left us the following notes: "The paddles for propelling a canoe are principally shaped from the *kahikatoa*, and when dry are extremely light, and fitted to bear a heavy strain of water. They are made extremely neat; the centre of the blade is the broadest part, tapering to a point. (See fig. 111, p. 159.) A carved paddle is rarely seen and is used by its owner as a truncheon to be displayed on gala days, when the chiefs stand up in the canoe, shouting and waving to the rowers to incite them to exertion, or as the solos which are responded to by a chorus and the exact keeping of time effected by beating the paddle in the water, which propels the canoe with great velocity. Paddles are generally four or five feet long, and those made use of for steering are six feet, and form the only rudder that the peculiar shape of a canoe can admit of as serviceable.

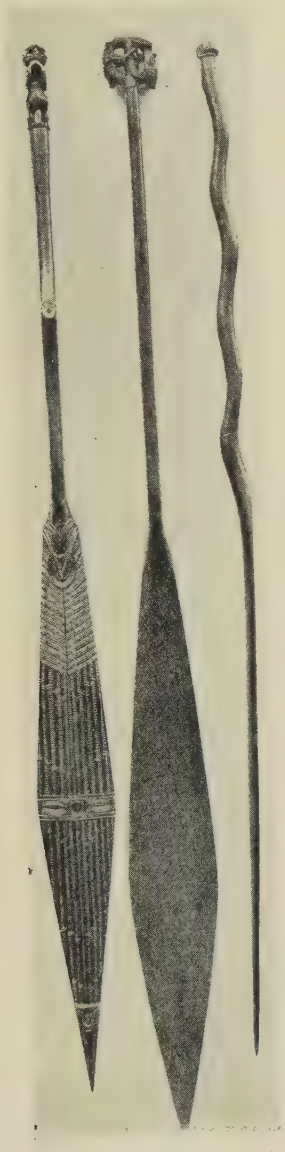
"The *kahikatoa*, of which paddles are almost invariably made, possesses an elasticity that enables the light thin paddle, whose blade at the edges is scarcely the sixth of an inch thick, to resist the powerful waves."

The *kahikatoa*, or *manuka* (*Leptospermum scoparium*), is a close-grained hardwood, strong and tough, though not durable when exposed to the weather. It is much used in the manufacture of implements. The steering-paddles of large canoes exceeded 6 ft. in length.

The following notes were contributed by Tuta Nihoniho:—

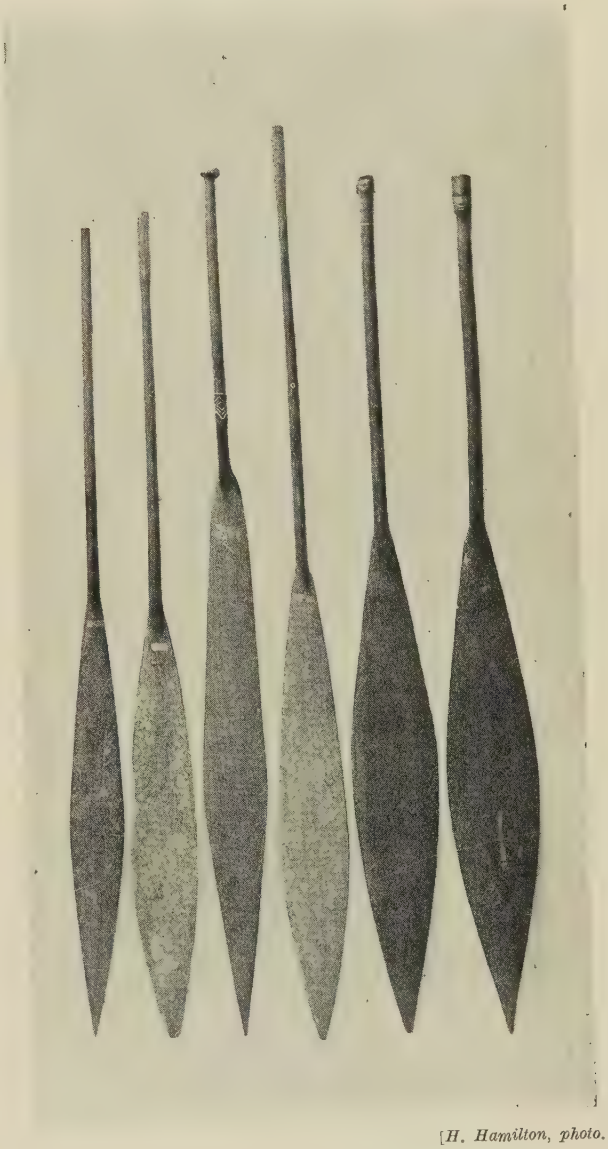
On the east coast paddles were made of several woods—*matai*, *manuka*, *maire*, heart of *pukatea*, and sometimes of *tawa*. A piece of suitable *matai* made a much-favoured paddle that was both light and strong. Occasionally the blades of paddles were adorned with painted patterns, but never carved, save in the case of certain ones not used in paddling, but only as a sort of ceremonial staff or baton.

The long steering-paddles are often described as *hoe whakahaere* (controlling-paddles). The *kai-whakatere*, or steersman, sits in a small seat at the base of the *taurapa*, or stern-piece of the canoe. When a canoe is being paddled one steersman is sufficient, but in the old days of sailing it sometimes needed two and even three steer-oars in a big canoe. When necessary a steersman would call upon another, or two others, to assist



[*H. Hamilton, photo.*

FIG. 110.—CARVED CEREMONIAL PADDLE TO LEFT; ON RIGHT A WAIKATO FORM WITH SINUATE HANDLE.



[*H. Hamilton, photo.*

FIG. 111.—SIX PADDLES OF COMMON FORM.

him. These two would be stationed on the first thwart, just ahead of the stern-seat, one at either side of the canoe, or one at the bow and one at the stern. Paddlers sat on the thwarts of big canoes, but in small ones squatted or knelt upon the flooring thereof, on which some fern would be placed.

When heavy waves are encountered by a canoe the vessel must not be so steered as to face them directly, at right angles, or she will dive headlong into the wave and be swamped; hence the bow is in such cases kept a little off, with the result that the canoe rides over the wave. But great care must be exercised in this operation, for if her head is brought round too far (*ka rara*) she broaches to, and disaster follows. At such times the steersman has to be extremely attentive and quick in order to enable the

FIG. 112.—A STEERING-OAR AND A PADDLE OF THE WAIKATO FORM.

[*Sketch by Miss E. Richardson.*

FIG. 113.—A PECULIAR FORM OF PADDLE OCCASIONALLY SEEN.

canoe to *karo nga pu tai*, as a native puts at—to ward off or avoid the seas—all of which is done by means of a dexterous turn of the paddle. Should an adept at the bow note that the bow is swerving off in a dangerous manner, he at once plunges his paddle deep down and uses it as a steering-paddle to swing the canoe back on to its course. To do this he holds the paddle obliquely, which causes the bow to swerve round. The steersman at the stern does the same, but on the other side of the canoe. With

one steersman at the stern and one at the bow a big canoe was managed in a remarkable manner.

In a canoe provided with a sail it was used whenever possible, but when on a lengthy voyage in which it was impossible to make land at night, and sail could not be used, then paddling continued uninterruptedly day and night, the men relieving each other. Women sometimes took part in canoe-paddling, especially in the smaller craft, such as river-canoes; in fact, they often managed the latter alone.

The *kai-hautu*, or fugleman, the chanter of the time-giving song, was a functionary pertaining to large and important canoes only. In some cases there were two such chanters, and these canoe-songs served to inspirit the paddlers and urge them to strenuous exertion. They were not chanted constantly, but at intervals; the men could not continuously keep up the extra exertion inspired by them.

The word *waihoe* is a general term to express methods of paddling. The *ranga* method is a quick stroke, and the *kukume* a slow one, while the *tia* is an alternate light and strong stroke. The first and last of these were employed in canoe-races.

When overtaken by a storm at sea a canoe was sometimes made to ride it out. In order to do so the anchor was lowered at the bow for some distance, and the rope made fast, and this had the effect of steadying the canoe and keeping her bow on to the seas. Meanwhile the crew stationed themselves near the stern, so as to counteract the effect of the weight of the anchor and keep the bow of the vessel well up. Without the steadying sea-anchor the craft might be swung round and capsized.

In some cases a working-paddle was adorned with a carved design at the end of the handle. The *hoe whakaara* is said to have been a long paddle used at the bow, and it was so manipulated as to have the effect of keeping the bow of the canoe up, but it is not clear as to how this was effected.

A long steering-paddle in the Dominion Museum (Turnbull Collection) is seen in fig. 114. It is 12 ft. long, and 7 in. wide across the broadest part of the blade. The end of the handle is round for some distance, then becomes oval in cross-section, and then gradually widens, flattens, and decreases in thickness from $1\frac{1}{2}$ in. to less than $\frac{3}{4}$ in. at the wide part of the blade. Apparently there has been a carved design on the end of the handle, which has been broken off. There are two figures carved in high relief lower down the handle, the upper one of which is double—two grotesque, semi-human forms placed feet to feet; the lower one is a single figure of similar design and 7 in. in length; the upper one is $8\frac{1}{2}$ in. long. There is a clear space of 20 in. between the two figures, while the distance from the lower figure to the blade-point is 6 ft. 7 in. Both of the carved figures show the orthodox three fingers of Maori carving.

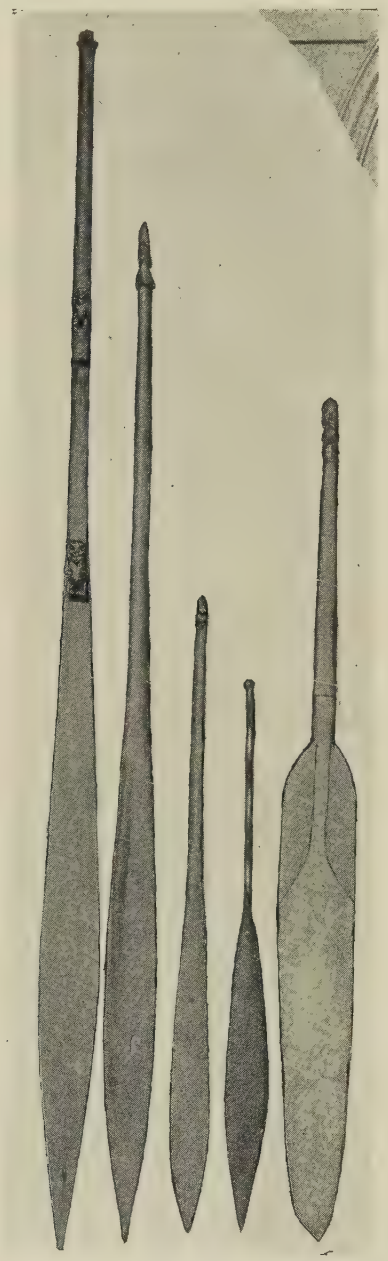
There are two fine steering-paddles in the Auckland Museum, one of which appears to be about 12 ft. long, and the other somewhat shorter.

In the Dominion Museum we have a small steering-paddle such as was used in the smaller canoes. It is 6 ft. 7 in. long, and $4\frac{3}{4}$ in. across the widest part of the blade, being narrower than many ordinary paddles. The carved design on the end of the handle is described as a *pokinikini*.

Steering-oars are straight, but properly-formed ordinary paddles show the blade set at a slight angle to the handle. This peculiarity is noticed in the side views given of paddles. When in use the rounded side (*taha koropuku*) of the paddle, which is the inner side of the angle, is forward, and the flat side is forced backward against the water. Maori paddlers can keep marvellously correct time in paddling. The kneeling position seems to have been the most common in paddling. Steer-oars could not be placed directly over the stern of a canoe, but were thrust over the side near the stern. Hiro, a Tahitian, informs me that his folk often confined the steer-oar in a form of grummet, and used it on the leeward side of the vessel. (See figs. 114 and 115A, pp. 162, 163.)

In some districts paddles were occasionally ornamented with painted designs, though these were ceremonial objects. (See fig. 116, p. 164.)

Of paddles seen at Poverty Bay, Parkinson says, "Their paddles were curiously stained with a red colour, disposed into various strange figures, and the whole together was no contemptible workmanship." There is a painted paddle in the Grey Collection at Auckland.



[*H. Hamilton, photo.*

FIG. 114.—FOUR STEER-OARS AND ONE PADDLE.

The longest of these is the Turnbull specimen; the one on right is from Mangaia. (See p. 161.)

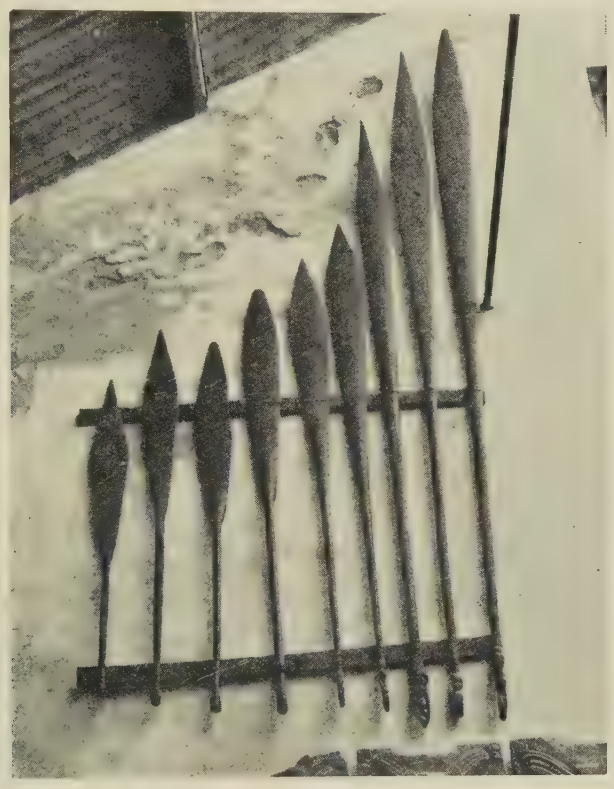
[*H. Hamilton, photo.*

FIG. 115.—FRONT AND SIDE VIEW OF COMMON FORM OF PADDLE.

Angas speaks of another method of adorning paddles, as seen by him at Taupo: "In the canoes I have also observed several of the paddles elaborately ornamented with arabesque designs in black and white, produced by charring the wood. Te Heuheu's son has been ornamenting some for me in a similar manner."

An ornate form of paddle used in a ceremonial manner as a baton was embellished by finely carved designs. A number of these exist in collections; they were not used for paddling purposes.

Polack furnishes the following: "The paddles are generally constructed of the *kahikatoa* tree; they are very light in weight, and neatly made. The blade is broad about the centre, ending in a sharp point. Some stain their paddles with red earth, but few are carved, except at the hilt. A carved paddle is made use of as a spear or truncheon on gala days, but is not adapted for the water. These paddles are generally four or five feet long, but those made use of for steering are some inches longer, and help to propel the canoes with speed."



[*W. R. Reynolds, photo.*

FIG. 115A.—PADDLES AND STEERING-OARS, IN AUCKLAND MUSEUM.

Polack was right: paddles with carved blades and hand-grip were used only as ceremonial objects, as a baton, and carried by a man during tribal functions, &c., as when addressing a meeting. (See fig. 117, p. 165.)

Bidwell speaks of trying to purchase a paddle that was most beautifully carved all over the blade, but, on account of the implement being *tapu*, or highly prized on some account, he was unable to obtain it. This was in the Bay of Plenty district.

Crozet writes that "The savages make use of paddles instead of oars; these paddles are of most perfect cut, and so shaped as to add by the elasticity of the blade to the force of the stroke. In certain points these paddles might serve as models to the boatmen of our ports. The paddles of the chiefs, who ordinarily command the canoes, are nicely carved on the back."

When a person of standing wished to borrow a paddle it was customary to hand over or send him one adorned with carving: to send him a plain one would be looked upon as a slight. But little carving, however, could be done on a working-paddle, as the blade and hand-grip must be left plain.

In his work on the Caroline Islands Mr. F. W. Christian speaks of the ornamented dance-paddles of those isles, and gives an illustration showing two from Metalanim, the blades of which have geometric designs, diamond and triangle, carved on them.

FIG. 116.—FOUR PADDLES ADORNED WITH DECORATIVE DESIGNS IN PAINT, IN ROBLEY COLLECTION, ENGLAND.

(See pp. 161, 162.)

Parkinson depicts a curious-looking implement, probably intended for a *hoeroa*, which he describes as "an instrument made of the bone of some large animal, probably a grampus, which is used sometimes as a paddle, and at others as a weapon, and is about five feet long." The *hoeroa* is a weapon made of whale's bone, and, being flat, might at a pinch be used as a paddle.

"At the Rangi-tikei, Mr. Scott showed me a cedar paddle that had been washed up on the beach. It was about five feet long, and probably had made a long voyage from some of the South Sea islands. Cedar is not found in New Zealand, and the shape of the paddle is quite different from the Maori fashion." Thus writes Mr. J. C. Crawford in his *Recollections of Travel*, &c., and he saw this paddle in 1862.

"The Maoris were busy making paddles. They work very neatly, with an adze made in their own fashion, a handle formed with a knee at an acute angle, and with a flat iron

[*From the Edge-Partington Series.*

FIG. 117.—PADDLE-BLADE ADORNED WITH CARVED DESIGNS, IN LIVERPOOL MUSEUM.

[*Sketch by Miss E. Richardson.*

FIG. 118.—PADDLE OF PECULIAR FORM, IN THE DOMINION MUSEUM.

adze-blade tied on." So again writes J. C. Crawford, the scene being Taumaru-nui. The flat iron adze-blade would probably be a plane cutter, or one made from a piece of flat iron, not a European adze-head.

Nicholas, an early writer, speaks as follows of the regular, rhythmical mode of paddling employed by the Maori: "The New-Zealanders have a custom, while paddling their canoes,

to cheer and animate each other to exertion at stated intervals, by shouting out simultaneously certain words, and they regulate the movement of their paddles with regard to the depth of water in which they are to put them, and the rate the canoe is to proceed at, whether

Fig. 119.—Old Paddle found in Monck's Cave; now in Christchurch Museum.

Fig. 120.—Details of Carving on Paddle-handles. [*H. Hamilton, photo.*

fast or slow, by each of these words. All this is done with such methodical exactness, and such wonderful unison of the paddles, that it would be supposed there was but one soul to give impulse to the whole of them."

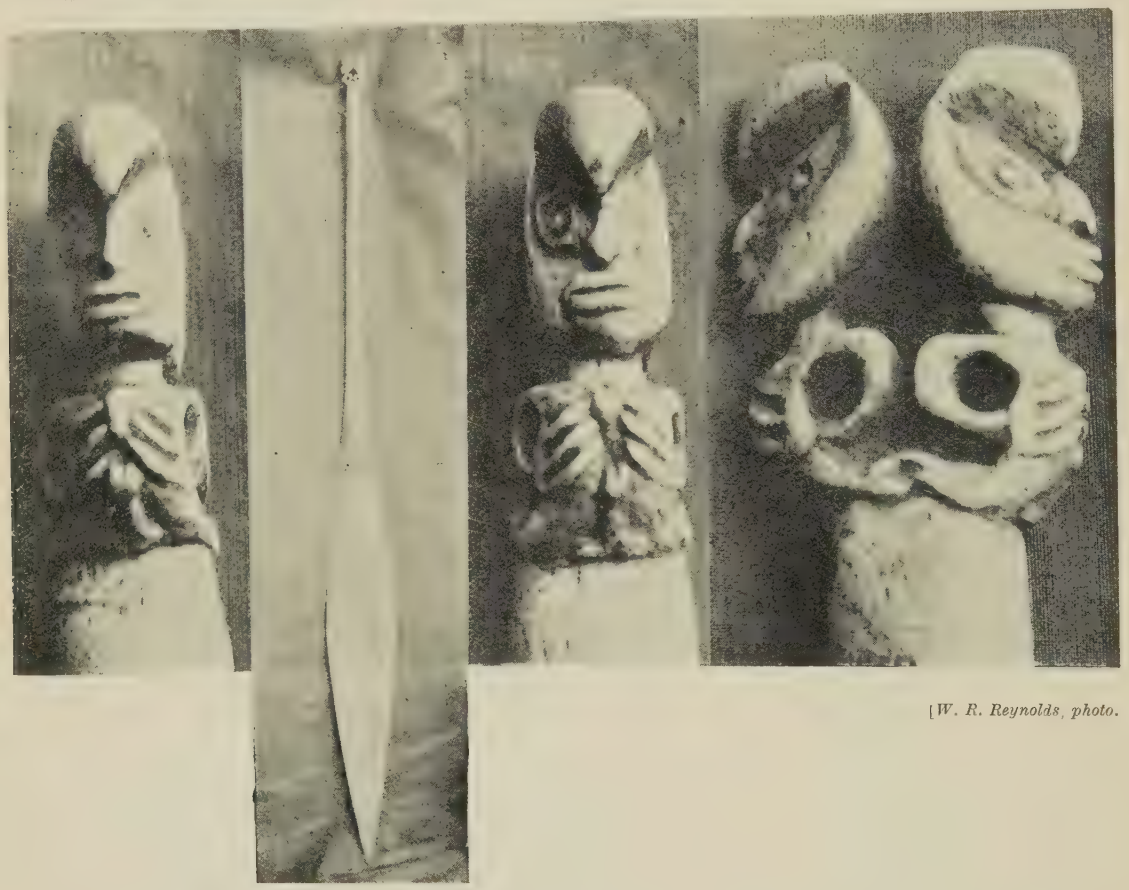
Of a canoe-race witnessed by him in 1814 the Rev. Mr. Marsden wrote: "One man in each canoe gave the signal for every stroke, which changed every few seconds. Sometimes the strokes were long and slow, at others short and quick. This change of stroke was for the purpose of lessening fatigue."

"To *tuki* was to give time to rowers in a canoe. To *tuki* a war-canoe required tact and skill. The chiefs prided themselves upon the proper performance of this function. Passing to and fro upon the narrow thwarts between the rows of rowers [read "paddlers"], itself an acrobatic feat, the *kai-tuki* gave the time, and inspired the crew by words, exclamations, short speeches, snatches of song, all delivered to time, with gesture, attitude, and motions of his weapon, also in time. In very large canoes there were sometimes two *kai-tuki*, the senior of whom promenaded the after part of the vessel, while the other occupied the fore part."—(From J. A. Wilson's *Ancient Maori Life and History*.)

Hochstetter remarks that the *kai-tuki*, "by singing and various gesticulations, incites the crew to ply their paddles, and denotes, by the rhythm of the song he chooses, the greater or less rapidity of stroke desired. Such a song is called *tuki-waka*. In large war-canoes, manned sometimes by sixty or seventy men, there are generally two *kai-tuki* acting as leaders, one placed near the bow and the other the stern. In addition to their voices, they have in the hand some native weapon which they brandish in time. They either sing by turns, one responding to the other; or they sing together, extemporizing at the same time various jokes and witticisms, by introducing into the traditional songs new verses having reference to the momentary situation. It is remarkable to see how the pullers are in this manner guided in keeping time. With as regular strokes as if managed by one hand, the paddles are moving on both sides, and with the same regularity the bodies of all the pullers are moving now forward, now backward; and as the time increases in velocity these motions also become faster and more energetic, until at last, with an almost convulsive tossing forward and backward of the head and the whole upper part of the body, their hair streaming in the air, the whole crew in wild chorus is repeating the last syllables or words of each verse chanted by the leaders. The sight of such a war-canoe fully manned and decked with festal drapery, while, propelled by the simultaneous strokes of sixty or more paddles, it darts along almost with the velocity of a steamboat, produces an imposing but almost an uncomfortably savage impression. It has the appearance of one body with a hundred arms and as many feet, every part of which is alive and in motion, like a gigantic centipede upon the water."

Colenso gives us a short account of a canoe voyage down the east coast in 1838: "One morning we left Tokomaru *pa* in a big canoe well manned; but the sea rose high before we had gained the southern headland of the bay, and for some time it was doubtful whether we should be able to round it, or ever land again, for we were in great danger. Apart from our perilous situation, it was truly a magnificent sight to see those big ocean billows breaking on the rocks around, and our little bark threading her winding way in the hollows between them. The chiefs, seeing the danger, held a short consultation, whether to go on, or to attempt to return to Tokomaru; I believe they would have returned, but they feared to attempt turning the canoe in the great swell we were in, lest it should be upset. I was never more impressed at the admirable skill at navigation possessed by the Maori. How readily the paddlers obeyed every command given by the skilled steersman, and how regularly and ably they wrought! The chiefs, too, and the *kai-tuki*, retained their standing positions in the canoe, and never flinched. On rounding the headland we landed in a delightful little cove, called Te Mawhai . . . and there launched a still bigger canoe, which was hauled up high and dry, and protected under a long covered shed. We started afresh for Uawa. On arriving at the bar at the mouth of the river most of our crew jumped overboard, and, holding on, took us over the bar in safety."

W. R. Wade, a sojourner in New Zealand in the "thirties," writes: "There is a great difference in the canoes of different tribes. The simplest form of a canoe is a solid tree, hollowed out into the required form, chiefly with adzes. This is called a *waka tiwai*. . . A single war-canoe will sometimes carry from eighty to one hundred men. . . In canoeing with natives . . . I have often found an advantage in getting a sharp, lively fellow to *tuki*. His extemporaneous song will consist of such matters as arise from the circumstances or feelings of the moment: grumblings for want of food, complaints of small payment, remarks on the Europeans in the boat, rejoicing that soon there will be plenty to eat, with occasional phrases and short sentences addressed to the rowers, bidding them to be strong, to let the oars dip deep, to pull altogether, &c. But whatever be the burden of



[*W. R. Reynolds, photo.*

FIG. 121.—A FINE PADDLE FASHIONED FROM WHALE'S BONE, AND THREE VIEWS OF CARVED EXTREMITY OF HANDLE OF SAME.

In Kronfeldt Collection, Auckland.

the song it admirably answers the purpose of keeping them in time and tune, and of speeding the canoe on its way."

The following is from Mr. R. H. Matthews's account of a fishing expedition: "Off we started to the refrain of '*Huka ka huka.*' This is a light and rather quick stroke of the paddle, intended more to churn the water into foam rather than to gain speed. . . Then followed a most exciting race for the fishing-ground and the first fish. All through the fleet [of fifty canoes] the natives were shouting '*Hoea!*' '*Tiaia!*' '*Toia!*' '*Pehia!*' '*Ana kumea!*' Roughly translated, these words are 'Pull!' 'Stick it in!' 'Drag it along!' 'Press it down!' 'Haul it along!' The last two mark deep, strong strokes of the paddles. The word *ana* is intended to make the stroke more strenuous; thus, at the

words '*Ana toia!*' '*Ana kumea!*' &c., every ounce must be put into the stroke. It was a brilliant moonlight night, and the whole fleet could be plainly seen paddling furiously for the channel. The shouting, yelling, and cheering, together with the noises that only the old-time Maoris could make, were indescribable."

A specimen of the old paddling-songs is given here as a sample of such productions: it was contributed by Tuta Nihoniho, of the Ngati-Porou Tribe, of the east coast:—

A Paddling Song.

Fugleman: He tia, he tia; he ranga, he ranga
Whakarere iho ana te kakau o te hoe koa.

Chorus by paddlers:
Ko manini tua, ko manini aro
Tangi te kura, i tangi wiwini
Tangi te kura, i tangi wawana.

F. .. Tera te haeata takiri mai ana i runga o Mata-te-ra.
C. .. Ana whaiuru, whaiuru; ana whaiato, whaiato
Arara tini, arara tini, ara ri . . . i!
F. .. E hara tena ko tena.
C. .. E hara tena ko te wai o te korio
Ko te wai o te korio
.. Hai koti, hai koti, hai koti-i . . . i!
F. .. Ka rere e . . . e! Ka rere e . . . e!
C. .. Te rere i te waka e kutangitangi, e kutangitangi
E kura tiwaka taua, e kura tiwaka taua
E kura wawawa wai!
E kura wawawa wai . . . i!
(*Here paddles held just out of water.*)
F. .. Toro patu tute tata.
(*Here paddles brought inboard and held vertically, handles downward, in the hold.*)
C. .. Takararau! Takararau! Takararau!
(*Here every paddle is tapped three times on the canoe, once at each repetition of the word* takararau.)

This performance with the paddles occurred, not at sea, but just as the canoe was approaching the beach, and immediately prior to the turning of the vessel so as to come to land stern first. After the paddles are drawn in the craft still swings forward on her way.

In the case of a fleet of canoes returning from a war expedition, when the paddling stopped with the *takararau* cry, the fuglemen of every vessel would give the starting-cry for the following *ngeri* or song:—

F. Kati, e te iwi.
C. E ko te wai o te hoe ka tarehua
E tata te kaikapea atu te roa o te whenua
E tata te kaikapea atu te roa o te moana
A ka tutuki te ihu o o waka
O waka paea noatia
Ka purua te waha o te tangata whakatinatina ki te riri . . . i . . . i
A pae ana i te aroaro, ka whiwhi hoki ana.

During the wild rendering of this song, decapitated heads of slain enemies (if any on hand) would be held up and brandished before the gaze of the folk on shore. Then the canoes were turned prow outwards and swung into the beach.

In all these songs, the wording thereof, as also vowel-sounds and punctuation, have to give way to the singular laws governing rhythm, in order to render the delivery euphonious to the Maori ear. Words are altered, vowel quantities lengthened, and other liberties taken with the vernacular in Maori song, in order to cause the delivery to be grateful to the native. If written as sung the type of song known as *ngeri* would be quite unrecognizable by us. For instance, the words "*paea noatia ka*" in the above are rendered as "*pae ano a tiaka.*"

Where . . . *i* occurs in the above at a line-ending it denotes that strong strokes have been given; then the paddles are held above water for a space as the powerful impetus causes the canoe to swing forward on her way. The *tia* and *ranga* methods of paddling, mentioned in the first line of the above, are explained elsewhere.

Canoe Time Song, used when two Kai-tuki *chanted the Time Song.*

First Fugleman:	Tena, pehia	*Second Fugleman:*	Nekehia
	Tena, kumea		Pono tereki
	Tena, tuku kau		Tereki
	Tena, tukua		Hurihuri
	Tena, tukua mai		Pono tereki
	Tena, whatiia		Tereki
	Tena, akina		Tereki
	Tena, aue toia		Tereki
	Tena, aua na		Nekehia
	Tena, tena mai		He mango tereki
	Tena, tukua mai		Nekehia
	Tena, akina		He rite
	Tena, toia		He rite
	Tena, toia mai		He rite tereki
	Tena, whatiia		Tereki
	Tena, takiritia		Tereki
	Tena, kokiritia		Tereki
	Tena, kumea		Kia mau
	Tena, taimaha		Kia mau
	Tena, koia hoki		Kumea
	Tena, ko te rite		Kia mau
	Tena, o te toko		Hikitia
	Tena, toia		Koia hoki
	Tena, hikitia		Ko te rite
	Tena, kei raro		Kia mau
	Tena, tango mai		Ko te rite
	Tena, kumea		Ko te rite
	Tena, unuhia		Kia mau.

In *Out in the Open* Mr. Potts discourses as follows concerning a canoe trip: "All being ready, the bare-headed paddlers squatting paddle in hand, the steersmen wearing strange head-dresses made of stained *algæ*, that look not unlike black curly wigs, set off by the insertion of a few feathers of the *huia*, the canoe slips out to the middle of the river with an easy gliding motion. Each plunge of the paddles is directed by the *kai-hautu* [*kai-tuki*], who shakes his paddle, or quivers his fingers, in exact time with the chant with which he encourages the rowers. Time is kept with most wonderful precision; the thirty paddles in the canoe dash aside the water at the same instant. The stroke most frequently used is one strong plunge of the paddle, which is succeeded by a mere dip, which lasts while the way is on the canoe given by the preceding strong stroke; in fact, it corresponds with the feathering of an oarsman. . . The paddlers increase the force of the plunging paddles. Both canoes dash onward in a terrific spurt; one feels the long craft bounding and quivering beneath the vigorous stroke. . .. We rush through the water as though borne onwards by a wild crew of demons . . the crew ease their paddling to a short quick stroke called *tupari*."

Shortland wrote as follows on Maori boat-songs and paddling: "Very much of the same order of composition as the *toto waka* are the boat-songs, called *toitoi waka* or *tuki waka*. In the long war-canoes two singers, called *kai-tuki*, stand on stages placed on a level with the gunwale of the canoe, one near the bow and the other near the stern. In addition to their voices, they have in the hand some native weapon, which they brandish in time, just as the leader of an orchestra brandishes the bow of his violin. Sometimes they sing alternate verses responding to each other, sometimes both together. By this means

the time is remarkably well preserved. I have seen fifty or sixty paddles plunge into the water so exactly at the same instant that the eye could mark no difference between them. The singer frequently introduces into these chants extremporary jokes, or other matter suitable to the occasion, to cause merriment and enliven and encourage the crew." In this description we note a somewhat different mode of procedure on the part of the *kai-tuki*. In this case they do not move to and fro.

In Sir Joseph Banks's journal we find the following remarks: "I have seen fifteen paddles of a side in one of their canoes move with immensely quick strokes, and at the same time as much justness as if the rowers were animated by one soul; not the fraction of a second could be observed between the dipping and raising any two of them, the canoe all the while moving with incredible swiftness. . . So much strength, firmness, and agility did they show in their motions, and at the same time such excellent time did they keep, that I have often heard above a hundred paddles struck against the sides of their boats, as directed by their singing, without a mistake being ever made." Again, he says: "In managing these canoes—at least, in paddling them—they are very expert. In one I counted sixteen paddles on a side, and never did men, I believe, keep better time with their strokes, driving on the boat with immense velocity. Their paddles are often ornamented with carving; the blade is of an oval shape, pointed towards the bottom, broadest in the middle, and again sloping towards the handle, which is about four feet long, the whole being generally about six feet in length, more or less."

Lieutenant Meade wrote: "They have a clever way of warding off with their broad paddles the little waves when just about to break over the gunwale of the canoe."

In the smaller canoes, or when a canoe had but one line or bank of paddlers, a paddler would occasionally shift his paddle to the other side of the vessel, so as to relieve the strain on his muscles. Mr. White writes: "While men are on a voyage from one village to another, if one of the party, in changing the paddle from side to side, accidentally lets the outer end of it come into the canoe, it is an omen of an abundance of food to be given to them on their arriving at their destination."

When during a journey by canoe the weather was calm, and the crew became weary of paddling, they would sometimes repeat the following charm in order to cause a wind to spring up, that they might utilize the sail of the vessel:—

Ko, ko, ko, hau nui, hau roa
Hau pukerikeri titi parerarera
Kokoia te tupe i raro nei
Homai he hau.

Women as Paddlers.

Early voyagers noted that Maori women were adepts in the use of the paddle. Nicholas, in speaking of the canoe of Ruatara, remarks: "His own canoe was a very attractive spectacle, being elegantly decorated with ingenious devices, and containing a group of the most beautiful young women in the island, who seated themselves at the paddle with a peculiar grace and easiness of attitude, while the pliancy of the action displayed their fine forms to the greatest advantage."

Dr. Marshall, who was at Whanga-roa in 1834, makes the following remarks: "In their canoes, which I had now an opportunity of examining at my leisure, I noticed little deserving of particular notice, unless exception be made in favour of the carving at the sterns and prows, which, after all, is only curious as the performance of a barbarous people, possessed of few and inadequate tools. This mode of ornamenting their boats admits of great variety, and, in consequence, hardly two of their boats are ornamented exactly alike. A head is the favourite device, more or less hideous, according to the taste or skill of the workman. The canoe itself is exceedingly simple, being formed of the trunk of the *kauri*, hollowed out with the stone adze, and tapered off by the same

tool towards the ends. A thick, broad plank on each side, in some cases carved exteriorly with a bas-relief of human figures, serves as a gunwale plank, and at the same time deepens the hollow of the canoe, to the top of which, along its entire length, these planks are spliced, somewhat after the fashion of a Masoolah boat, the intermediate seam being caulked with a sort of coir rope. The interior fittings are more simple than the exterior decorations, consisting of a strong grating laid along the bottom of the canoe, and forming a place of storage for their provisions when required to proceed on a voyage; a few cross-sticks, in the better sort carved and smoothed, serve for thwarts. But these are more commonly wanting, the paddle being plied with equal facility when those who handle it are seated at the bottom of the canoe as when they occupy the more elevated seats, and, it may not be amiss to add, with equal dexterity by men and women; one of the latter I once observed at the end of a little boat plying her paddle with indefatigable industry, although a mother and a nurse, her infant being occasionally transferred from the breast to a mat at her feet, and *vice versa*, as circumstances required.'

Again, the same writer, in speaking of canoes seen at the Bay of Islands, says: "The chiefs, with their retainers . . . came in large and handsome canoes, some of them upwards of forty feet in length, and all gaily decorated with tufts of white feathers at the prow and stern. In one of these there were fourteen thwarts, and a shifting deck or grating, very neatly put together, under which the provisions were stowed as in a hold. Large unoccupied spaces, one in the centre and one at either end, are left for the accommodation of the principal persons of the tribe, who stand there and encourage the paddlers, and thence harangue their foes."

Steering.

"The function of the rudder," says Colonel Fox, "which in the primitive vessels of the southern world is still performed by the paddlers . . . as sails began to be introduced, was confided to the rearmost oars. In some of the Egyptian sculptures the three hindermost rowers on each side are seen steering the vessel with their oars. Ultimately one greatly developed oar on each side of the stern performed this duty." He might have added that the two were reduced to one, as in the modern whaleboat. The Maori, when paddling alone in a small canoe, steers it with ease, often changing sides with his paddle. When a number are paddling, as on a coastal trip, one man will steer. But in times of stress in deep-sea voyaging they would employ two steerers at the stern, and two more men wielding the long *hoe whakaara* near the bow, to control that part of the vessel.

If a *kai-hautu* (syn. *kai-tuki*), or any person in command, noted some aspect of irregularity in the paddling he would call out "*Kia tokihi te waka, kia reti*" (*i.e.*, cause the canoe to glide smoothly through the water by paddling in a more uniform manner).

Another cry, "*Uea te waka*," is a command to swing the head of the craft round, which is done by holding the paddle in a certain position, a performance described by the terms *ue* and *koue*. "*E! Kouea te waka!*"—a cry to steersmen to turn the bow of the canoe, as when she swerves off her course. Williams gives *tirou*—to move a canoe sideways by plunging the paddle into the water and drawing it towards one.

While D'Urville was sojourning at Uawa the advantages of the rudder were appreciated by the natives: "The rudder struck them particularly, and they gravely considered its utility, with frequent marks of approbation. The tiller was confided for a moment to one of them, and the promptitude with which it changed the direction of the boat in its rapid pace ravished them with admiration."

Moser, of *Mahoe Leaves* fame, wrote in 1863: "This canoe you see is hewn out of a solid tree, it is almost thirty feet long, not more than thirty inches wide, and scarcely that in depth, but were you to stand upon the edge you could not capsize it. And

the fact is, plain as they look, in expert hands they not only carry large cargoes for their size, but will stand in far rougher water than you would imagine. In one of these canoes, only much larger, I was once fishing on the coast when a squall caught us, and a very nasty sea began to get up before we reached land: we landed through the breakers without taking a drop of water aboard, while a whaleboat that was out with us, though very fairly manned and steered, had a very narrow chance of being capsized, and the crew, as it was, were very much drenched. The art, I believe, is always to catch the seas on the quarter, and on no account to lay the head on."

Thomson remarks that the Maori had forgotten the art of steering canoes by the stars, and had receded rather than advanced in civilization. But he has not needed to steer by stars for some centuries past, having given up ocean voyages and confined himself to coastal trips, in which he did not go out of sight of land.

On the return of a fishing party, the canoes, when hauled ashore, were often turned bottom upwards, so that they might quickly dry.

Tuta Nihoniho contributes the following note concerning a custom practised on the east coast: "In former times canoes of importance were brought to land stern first, being turned round just before reaching the beach, and backed in: the prow must not strike the beach. This relates to sea-going canoes only. Should the water be too rough near the beach to make the necessary turn, then it is effected out at sea, outside the breakers. It would be most unlucky to run the canoe ashore bow first. River-canoes have no such restriction on them, and if a big sea-canoe be taken into fresh water the rule does not then apply to it. The custom originated, we are informed, far back in the days of Tane and Tangaroa, of Maori myth—the former a land-deity, representing trees (hence a canoe is often styled "Tane"), the latter a sea-god. Tane and Tangaroa are ever at war, and the above custom was an old superstition connected with their striving to overcome each other. The superstition is connected with the myth of Ikatere and Tu-te-ihiihi, who represent sea-fish and lizards. When the offspring of the former are cast ashore they are devoured by the offspring of Punga, of whom Tu-te-ihiihi was one—such as worms, flies, &c.

The only exception to the above mode of bringing a canoe to land was when a stricken craft arrived with a few survivors on board, having met with some mishap. In turning a canoe to bring her stern first into the beach the paddlers would turn in their seats.

In his *Missionary Enterprises* Williams speaks of the natives of Atiu, Mauke, and Mitiaro (of the Cook Group) as having, "with very considerable ingenuity, so constructed their canoes as to be enabled to use boat-oars, which they prefer as being far less exhausting than their paddles." This shows that these natives must have borrowed the system of rowing soon after their first intercourse with Europeans. The natives of the west coast of the South Island of New Zealand either employed oars or used paddles as we use oars in the early days of European settlement. They probably acquired this art from the sealers of still earlier times.

It will be noted that the Maori does not allow carved ornamentation to interfere with the usefulness of a paddle. The hand-grip must be left clear and smooth. The carved designs on the end of the handle are of interest, and show a variety of patterns. Edge-Partington depicts one in the Whanga-nui Museum that has a bird's head—an unusual device—carved on the end of the handle, with a scroll on the side of the head.

The following specimens of paddles of various parts of the Pacific are depicted in Edge-Partington's *Ethnographical Album of the Pacific Islands.* A paddle of Pleasant Island is of true Maori form, blade and handle. Three from the Marquesas Group have leaf-shaped blades with curiously projecting ends. Such ends are noted on paddles from the Gambier Isles, but these have blades like a rounded spade-blade. A Mangaia paddle has a straight-sided blade resembling a Solomon Island form. A number of the

elaborately carved ceremonial paddles of Raivavai, or High Island (Austral Group), are shown. A paddle of Tahiti, and another of the Hawaiian Isles, show a rude form quite unlike Maori paddles, the blade being short and spade-like. Six Solomon Isles paddles have blades resembling the lanceolate Maori form, while four others from the same group have short elliptic blades. Yet another form from this group is shown as having a spade-like blade with straight edges, the end carried to a point. The Mangaia paddle shown is of the latter form. Paddles of New Britain carry an elliptic blade; those of the Admiralty Isles are lanceolate. Some from New Guinea have elliptical blades. Paddles having lanceolate, elliptic-lanceolate, and ellipsoidal blades are met with in the Pacific area, as also others with straight-sided blades.

The terms *hoe tairanga* and *hoe whakaumu* as applied to paddles I cannot explain. *Akau* and *tapaki* also appear to denote forms of paddles, as given at page 155 of volume 21 of the *Journal of the Polynesian Society*.

Bailers and Bailing.

In canoes fitted with a floor or deck one or two spaces are left therein so that bailing operations may be performed. The illustrations given show the peculiar form of the Maori

[*T. W. Downes, photo.*

Fig. 122.—Canoe-bailer, showing Finely Executed Carving, in Whanganui Museum.

bailer, with its forward projecting handle that prevents undue strain on the wrist. The bailers having the straight handle in the rear are most trying to use, and are said to be quite a modern form.

Bailers were made from various woods—*hinau*, *matai*, *maire*, &c. Each bailing-place had a person allotted to it to act as bailer when necessary; in some cases two persons would bail from the one hole at the same time.

The *karakia tataa*, or bailing-charms, were recited while the process of bailing was going on, but apparently not on all occasions. The following is said to be a charm repeated when bailing a canoe:—

Mimiti pakora te tai tapu ki Hawaiki
Ararawa E! Kawea au ki uta
Te Kohu-tirikawa E! Kawea au ki uta
Ki te ahuru i uta, ki te tota i uta
Ki te moenga i uta
E au ai taku moe.

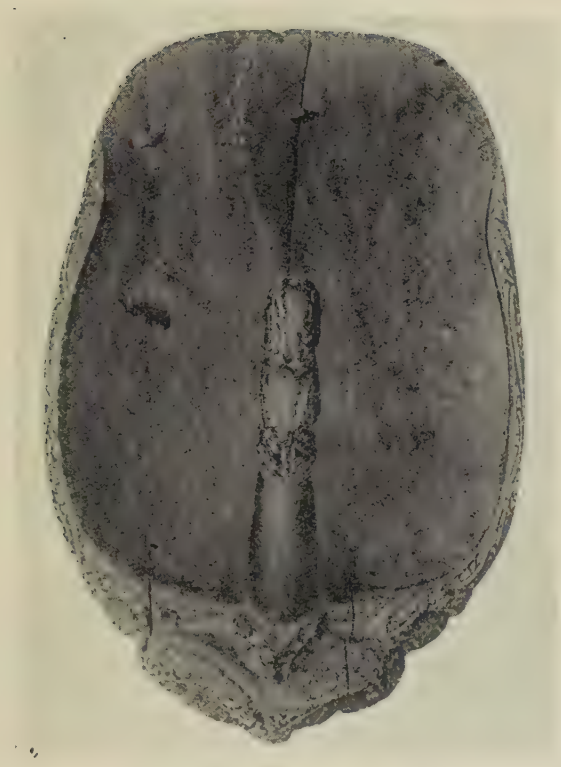


Fig. 123.—Old Canoe-bailer found in Monck's Cave; now in Christchurch Museum.

Fig. 123a.—Old Bailer from Akaroa District.

[*W. R. Reynolds, photo.*

Fig. 124.—Ten Bailers in Auckland Museum.

In this effusion the reciter calls upon two beings, either sea-monsters or ancestral spirits (and one being can represent both), to convey him to shore—that is, to his destination, to the sheltered home where sleep is sound.

Parkinson remarks that he saw part of a human skull being used as a canoe-bailer in the Bay of Plenty.

The bailing-place in a canoe is known as the *puna wai*, or *tainga-wai* (*tainga-a-wai*). The bailer is *tata*, *tiheru*, and *ta wai*.

Fig. 125.—Old Bailer from Tolaga Bay.

Length, 2 ft.; width, 1 ft. 2 in.

The bailers of Funafuti, Ellice Group, are of the same form as those of New Zealand, with the forward projecting handle, but are of rough finish. In some other groups they are much more neatly made, and embellished with carvings. Occasionally the tongue-like handle curves downward and is connected with the bottom part of the bailer. There is one of this form in the Dominion Museum.

The Ngati-Mahuta folk call a paddle "the leg of Mahuta" (*Te waewae o Mahuta*), their eponymic ancestor being a person who made much use of canoes in travelling.

In small canoes of the *tiwai* type there is, of course, no room for two paddlers abreast, and each person has to sit in the middle of the canoe; indeed, one person is sufficient to paddle such a craft Big canoes afforded room for a double row of paddlers, one on either side, two sitting on each thwart.

In rough weather, when a canoe was shipping much water, two men were employed at each *puna wai*, or bailing-well. They were stationed on opposite sides of the hole in the floor, and filled their bailers alternately. As one man filled his bailer with a scooping motion, the other was emptying the contents of his over the side.

In Edge-Partington's *Pacific Album* are depicted bailers of Tahiti, Samoa, Fiji, New Hebrides, and New Caledonia, all showing the forward projecting handles of the Maori

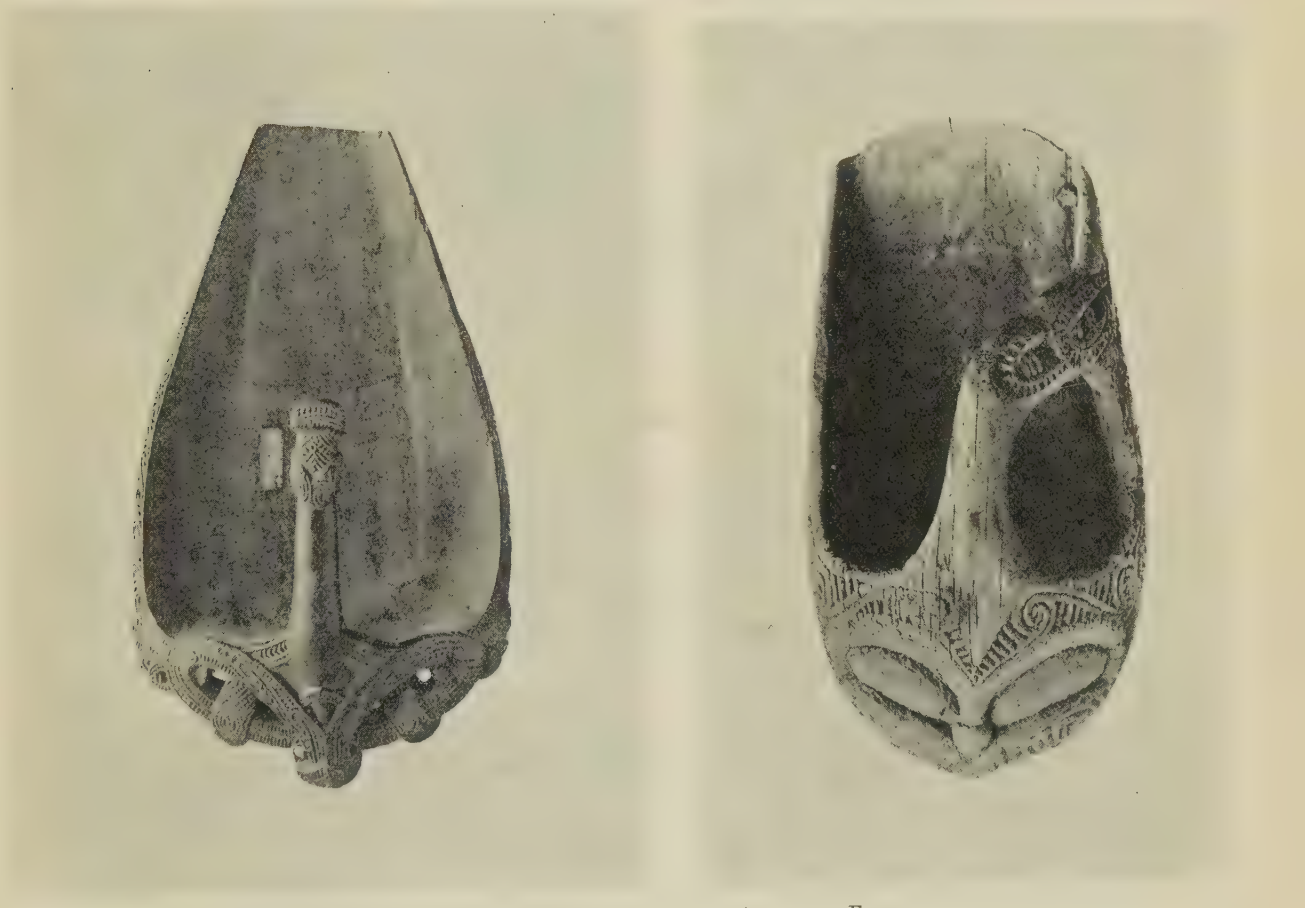


Fig. 126.—Two Canoe-bailers, One of Abnormal Form.

bailer. The same form is used in a region of New Guinea. This handle in some Maori bailers has been fashioned into phallic form.

Sails and Sailing.

The Maori used sails of the triangular form that is, or was, so widely employed in the Pacific. This form of sail has been carried far over the oceanic area, and is by no means confined to Polynesia. Minor differences occurred in its shape, but its general form and manner of use was much the same in many groups. A specimen of the triangular form used in New Zealand is preserved in the British Museum. (See fig. 133, at p. 187.)

The Maori terms a sail *ra*, *komaru*, *mamaru*, *whakawhiti*, and *whara*, or *ra whara*, of which the first is the most generally used. Curiously enough, the first three names

are also applied to the sun. *Ra whara* seems to mean "mat sail," *whara*, *wharariki*, and *tawhara* all being applied to mats. Evidently this name originated in the name of the *Pandanus* (*whara*, *fala*, *fara*, *ara*, *hara*, and *hala*, in various dialects of Polynesia), from the leaves of which mats and mat sails were made. Mr. H. B. Sterndale has told us of

[*W. R. Reynolds, photo.*

FIG. 127.—FOUR BAILERS OF INFERIOR FORM, IN AUCKLAND MUSEUM.

FIG. 128.—CANOES AT TURANGA-NUI (GISBORNE) IN 1836.

From Polack's *Travels and Adventures in New Zealand.*

the uses to which the leaves of the *Pandanus* (*whara*) are put by the natives of Polynesia, as sails for canoes, mats, roofing-material, &c. Of a preparation of the fruit of this useful tree he remarks, "All the navigating savages of the North Pacific victual their canoes with it when they go to sea."

This usual form of Maori sail was not of the style seen in the Mediterranean and adjacent seas, with a yard slung across the mast and supporting the sail. The ordinary form of Maori sail is correctly illustrated in the *Voyage of the Astrolabe*, the only work that gives us accurate representations of the *waka maori*, or native canoe. In these views we see that the mast is upright, and that the sprit employed to extend the sail is shown at various angles according to the width of the sail. (See figs. 128, 130, 132, 133, at pp. 178, 182, 185, 187.)

The material usually employed by the Maori in making sails was the leaf of *raupo*, of which Colenso says, "Their canoe-sails were curiously constructed of bulrush-leaves laid flat edge to edge, and laced across with flax."

Tuta Nihoniho informs us that among the Ngati-Porou Tribe canoe-sails were made of *harakeke*, *kiekie*, and *raupo*—that is, of leaves of *Phormium*, of *Freycinetia Banksii* (a climbing-plant), and of bulrush. The *Phormium* leaves were woven or plaited as a floor-mat is made, but were split before being so used. The leaves of *raupo* (*Typha angustifolia*) were used whole, and, not possessing any fibre, were not split or plaited, but laced together (*he mea nati*) by ties at intervals, two strings being used for this purpose, and each leaf having the two passed round it separately in order to secure it—a process not unlike that by means of which the *harapaki* decorative designs are formed. The *raupo* sails possessed the advantage of being much lighter than others. Tuta remarked that he had seen these sails in his youth. Portions of the edges were sometimes ornamented with feathers.

Wakefield wrote as follows: "The former native sail for a canoe was made of a fine grass, woven into very pretty patterns, with a graceful openwork in various parts." It is doubtful if any fine grass was utilized in their manufacture.

In the tradition of the coming of "Takitumu" from eastern Polynesia to New Zealand it is stated that the sail was made of *aute*—*i.e.*, of the coarse paper-like fabric made from the bark of *Broussonetia papyrifera*. This sail was named "Pari-nui-te-ra."

The Rev. Mr. Wade, a traveller in New Zealand in the "thirties" of last century, wrote as follows: "The ordinary canoe-sails in use among the natives have a very mean appearance; but sometimes they will take the pains to prepare strong and handsome sails, made of the dried split leaf of the flax-plant, and decorated with tufts of downy feathers. With boat-sails the natives are rather too venturesome, as they will make the sheets fast in order to take their ease."

Mr. Barstow says of these sails: "These were made of the long leaves of the *raupo*, kept in their places by an interlacing of flax-twine; the butt or wide part of the leaf was uppermost toward the boom, the small ends of the leaves converging to a point at the tack, making thus a triangular sail. Two or three masts were used, according to the canoe's length." The leaves of which the sail was composed were parallel with the sprit or boom; the above remark reads as though the boom (sprit) was across the top of the sail. It is very doubtful if three masts were ever used in a local Maori canoe, though two, and occasionally three, were certainly used in deep-ocean voyages in former times, and occasionally two were used on local vessels.

Polack, another early sojourner in New Zealand, writes: "The sails are the most clumsy and heavy articles that could have been invented. In shape they are triangular, formed of bulrushes dried in the sun and tacked together, the upper edge being cut into vandykes. It is fastened to two poles which serve for mast, yard, &c. The sheets are formed from plaited flax fastened to the head of each pole."

In Becket's account of Cook's first voyage we were told that he left Tolaga Bay on Sunday, 29th October, 1769, and sailed northward. On the 31st several canoes were seen, one of them containing sixty natives. On Wednesday morning forty or fifty canoes were seen along shore. The double canoe seen near Whale Island is referred to as follows: "In the evening a double canoe, built after the model of those at Otahitee, but carved and decorated according to their own peculiar manner, followed us a long

time, the Indians appearing in good humour, and frequently dancing and singing. . . . The next morning the same canoe pursued and overtook us about nine o'clock; she carried a sail of an odd construction, which was made from a kind of matting, and of a triangular figure, the hypothenuse, or broadest part, being placed at the top of the mast, and ending in a point at the bottom. One of its angles was marled to the mast, and another to a spar with which they altered its position according to the direction of the wind, by changing it from side to side."

Wakefield remarks that sails were sometimes woven in patterns, with a graceful openwork in various parts. A zigzag design may be seen running the full length of the British Museum specimen. This specimen is made of fine strips of either *Phormium* or *Freycinetia*, both of which are much more durable than *Typha*, though not so light. Leaves of the *Typha* contain no fibre, and when thoroughly dry are brash; when put away they soon decay. The above sail has loops or cringles along its sides for the purpose of attaching it to the mast and sprit. Towards the upper end of the sail is a *matairangi*, or pennant. Both this and the upper edge of the sail are adorned with feathers. This is probably the only Maori sail that has been preserved.

In his account of Cook's second voyage, Forster writes as follows of a canoe seen at Queen Charlotte Sound: "June 1, 1773. Several canoes full of natives came on board. . . Their canoes were of different sizes, and three of them had sails, which are but seldom seen among them. The sail consisted of a large triangular mat, and was fixed to a mast, and a boom joining below in an acute angle, which could both be struck with the greatest facility. The upper edge, or broadest part of the sail, had five tufts of brown feathers on its extremity."

Sir Joseph Banks has left us the following: "In sailing they are not so expert; we very seldom saw them make use of sails—and, indeed, never, unless they were to go right before the wind. They were made of a mat, and instead of a mast were hoisted upon two sticks, which were fastened one to each side, so that they required two ropes, which answered the purpose of sheets, and were fastened to the tops of these sticks. In this clumsy manner they sailed with a good deal of swiftness, and were steered by two men who sat in the stern, each with a paddle in his hand."

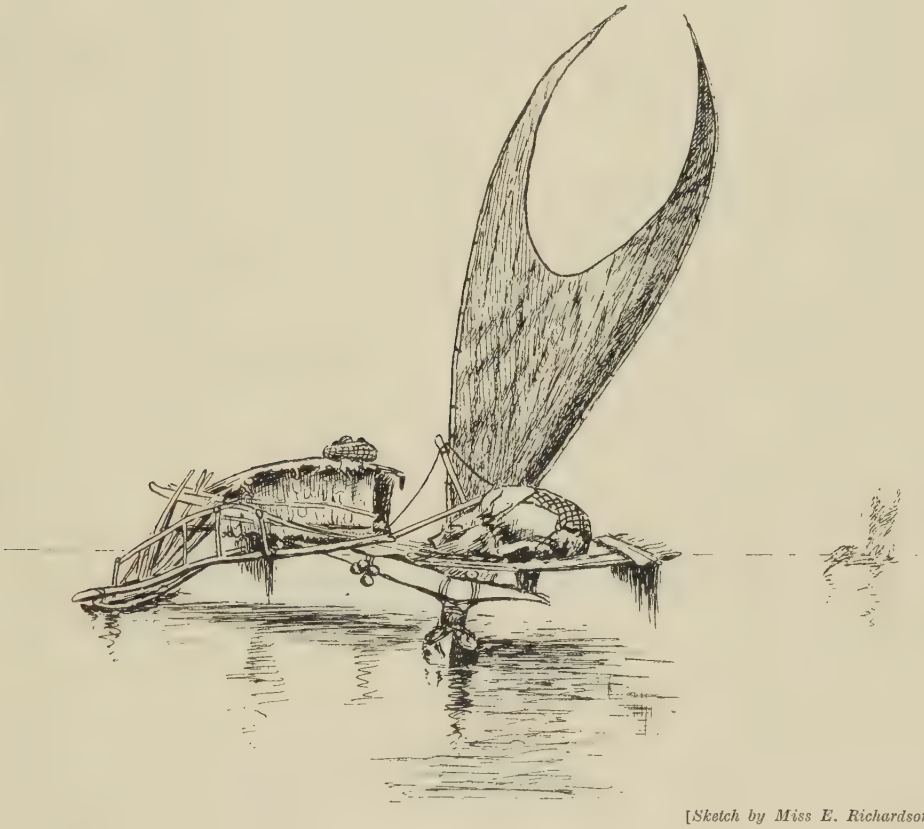
In Tasman's journal is a remark to the effect that two of the canoes seen by him at Massacre Bay hoisted "a sort of tingang sails," of which a footnote remarks, "Small boom-sails or yard-sails, as carried by tingangs (small Indian vessels)." (See McNab's *Historical Records of New Zealand*, vol. 2, p. 23.)

In writing of the coming of the Maori to New Zealand Mr. J. A. Wilson speaks as follows of the Maori canoe: "Speaking generally, they were rather crank in build and disproportionately long for sea-going purposes; but they could accommodate many rowers [read 'paddlers'], and in smooth water were able to make good progress for a few miles by pulling [paddling]. Their draught was too light for sailing close to the wind. They required to be about seven points off the wind to move through the water properly, which, with heave of the sea, and drift when the sea was rough, would make a true course, say, of eight points, the course they would have to make in crossing the south-east trades. Their lines were so fine that, with a fair wind, they sailed very quickly. One fault they all had, and that was leaking through the caulking of the topsides. This was due to the nature of the construction of the vessel, and was unavoidable in the absence of ironwork attachments. The whole force of propulsion by sailing or pulling [read 'paddling'] came upon the lashings that secured the topsides to the body of the canoe. This caused the seam to work a little, and bailing was necessary from time to time when the canoe was deeply laden. If the lashings were sound the fault was one of inconvenience, not of danger."

The remark of Mr. Wilson to the effect that the "whole force of propulsion" came upon the lashings of the top-strake does not seem to be quite correct.

The remarks of Sir J. Banks seem to imply that no mast was used by the Maori. But one of the poles was certainly used as a mast, fixed in an upright position and braced with stays, as is seen in one of D'Urville's plates. The second pole may be termed a sprit (*tatakoto*, *titoko*, *takotokoto*, *kotokoto*). To its upper part were fastened the sheets (*waha*, *kotokoto*). The mast was called a *tira*, *tokotu*, *tiratu*, and *rewa;* the stays and braces were termed *purengi*, *puwhenua*, and *waewae*. The sprit kept the sail extended, and, being unconfined save at its base, it was controlled by means of the sheet. The narrow lower end of the sail was called the *taketake*, and the upper end the *tahatu*. Williams gives *taura whakaara* as the name of the forestay of a sail, and *tukuroa* as the backstay.

We have no data to show the actual form of sail employed by the Maori in his voyages from eastern Polynesia to New Zealand. Cook found the Society-Islanders using



[*Sketch by Miss E. Richardson.*

FIG. 129.—THE "CRAB-CLAW" OR "HALF-MOON" SAIL OF PACIFIC ISLES.

Canoe of Santa Cruz, showing outrigger and balance-platform.

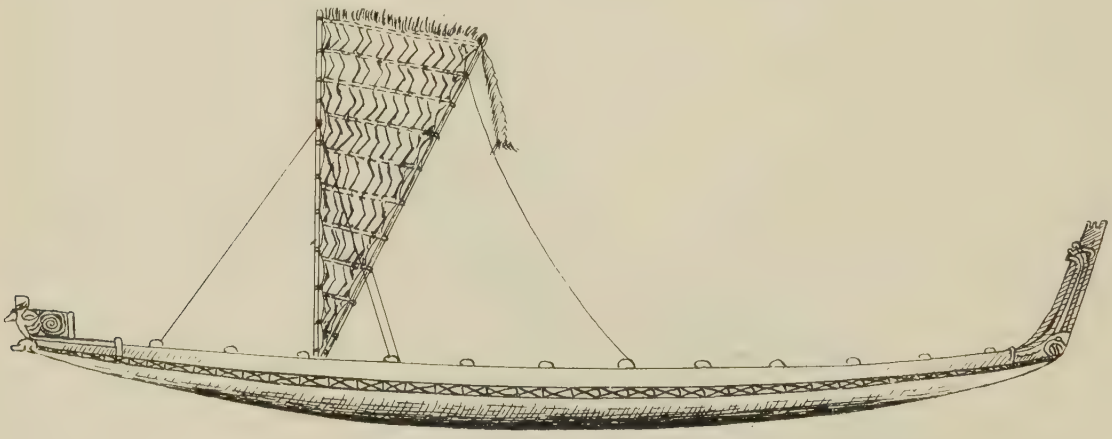
the "arrow-head" or "half-moon" sail, and the Hawaiians using a somewhat similar form, while the Maori of New Zealand was then using only the triangular, straight-edged form. The Tahitians may have adopted the "half-moon" sails, which extends westward into Melanesia, since the Maori broke away from those parts, or the Maori may have adopted the straight-sided triangular 'form since he settled here. A triangular sail is said to have been employed by the New-Caledonians.

In one of D'Urville's plates it will be noticed that when not in use the sail of a Maori canoe was stowed by placing it, still attached to mast and sprit, on the thwarts of the canoe, leaving room for paddlers on either side. (See fig. 75, p. 109.) When setting the sail, or in taking it down, the mast, sprit, and attached sail had to be lifted

bodily into position. A *raupo* (*Typha*) sail could only be rolled or folded in one way, with folds parallel with the mast; to attempt to fold it the other way would cause the dry, brash leaves to break. Evidently the Maori had not advanced far in the matter of sailing-gear, nor did he use the huge sails employed by the Tongans, borrowed by them from Fiji.

The sails depicted in D'Urville's plates seem to be secured to the mast and sprit by means of a running cord, and one sail seems to have something in the form of a bolt-rope on one side. (See fig. 130.)

In Watkins's painting of the departure of the six canoes of the historical fleet from Polynesia for New Zealand the vessels are depicted as double canoes with the curious crescent-shaped sails used by the Tahitians at the time when Europeans first visited them, and figured in Ellis's *Polynesian Researches*. This may be correct, but we have no exact information as to the form of the sail used by the Maori at the time that he came to these shores. If he ever used the Tahitian form seen by Cook, then he must have discarded it later for the straight-edged triangular form shown in our illustrations. The same picture shows either a wooden ladder or shrouds with ratlines for the purpose of ascending the mast. This was not a Maori usage, and, so far as we are aware, was confined to the large canoes of the Paumotu Group.



[*Copied by Miss E. Richardson.*

FIG. 130.—MAORI CANOE DEPICTED IN D'URVILLE'S VOYAGES.

Shows the *ra kautu* form of sail.

The sail of the canoe in Goldie's "Coming of the Maori" painting is triangular in form, but wider at the top, in proportion to its height, than the Maori sail in the British Museum. It also has three intermediate poles between the mast and sprit; but this latter pecularity is quite unknown to us as a Maori form, and elderly natives discredit it.

Sails are said to have occasionally been made from stems of the *kuwawa* (syn. *kuta* and *kutakuta*), *Eleocharis sphacelata*. Though not possessing any strong fibre, this material would probably be more serviceable than *Typha*, as it does not become so brash when dry.

The mainsail of a large two-masted canoe was called the *ra turuturu matua*, and the after one *ra tauaki*, among the east coast tribes.

The following particulars concerning canoe-sails and the manipulation thereof were furnished by Tuta Nihoniho, of the East Cape district, a most enthusiastic contributor of information pertaining to Maori technology, &c.: Sails were fixed in two different ways, vertical and slanting, but both were of the same triangular form, and hoisted with the small end downwards. A single sail seems to have been usually used, but large canoes might have two, and it is said by Tuta that in olden times a very big vessel

might even have three sails: this would be in deep-sea voyaging. The "Arawa" is said to have had two sails. We speak of one or more "sails," not "masts," because the masts were not permanent erections: the sails were attached to the masts and the two raised together. Double sails—rather, two single sails on two different masts—were alluded to as *parerua*. If but one sail were used, it was just forward of the middle of the canoe.

The upright form of sail is known as a *ra kautu*, and the one fixed in a slanting position was a *ra kaupaparu*.

The upright sail had its upright mast stepped in a *takaore*, or small ring of rope, a grummet made of a single piece of rope seized with a small cord. This was attached to the side of a thwart by lashing, and when raising the mast with its attached sail the base of the mast was inserted in the ring and thrust downward through it until a shoulder on the mast rested on the ring. When the mast was up the four stays were made fast: two of them were fastened to the thwart against which the mast stood, one on either side, so as to act as shrouds and prevent the mast sagging sideways; two other ropes led fore and aft of the craft, and were made fast to thwarts; thus the mast was braced four ways.

When raised, the sail is furled against the mast, to which it and its sprit are tied. When the mast is secured, then the tie is taken off and the sail opened out, its sheet being passed round a thwart and held in the hand; occasionally, when considered safe, it was tied to the thwart, but only in the case of a light and steady wind. Should a squall of wind strike the craft—and adepts could always tell when one was approaching by the appearance of the ocean (*ka kitea ki te hinatore o te moana*)—then the sheet-tender slacks off so as to let the sail veer round, in order that the full force of the wind may not catch it broadside on, which same spells danger. When the squall passes, the tender pulls the sheet in to restore the sail to its former position.

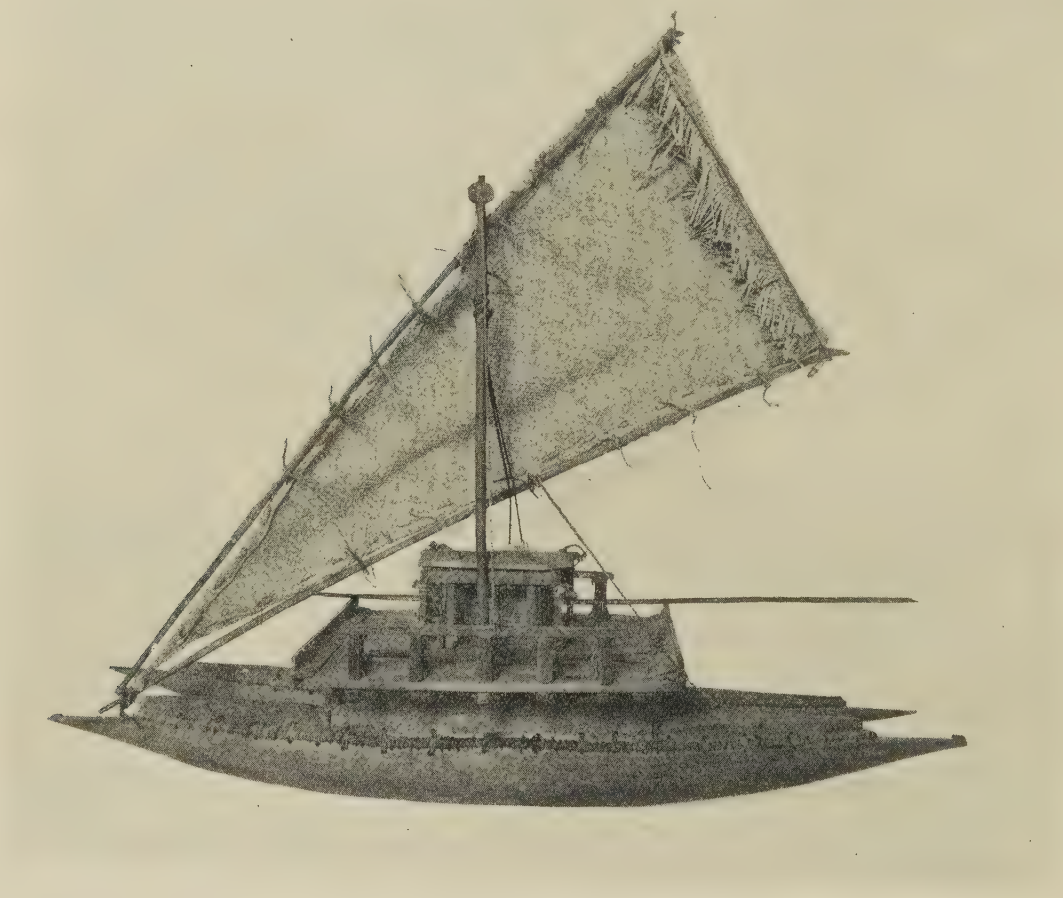
The sprit of the sail was secured at its lower extremity to the bottom part of the mast, just above the thwart, by means of a rope ring or cringle fixed as a step, but loose, so as to allow the sprit to move. A bolt-rope ran along the top of the sail, between the heads of the mast and sprit. Feather ornaments were secured along the top of the sail and down the outer edge thereof—*i.e.*, the side at which the sail was secured to the sprit. At the upper corner of the same side a long streamer was attached. The sail was fastened permanently to the mast and sprit, and the whole had to be raised and taken down together. To take the apparatus down, the sail was furled, it and its sprit lashed to the mast; then the braces were released, the mast unstepped and taken down, and the whole stowed away on the middle of the thwarts, as shown in D'Urville's illustration.

It is said that *tanekaha* (*Phyllocladus trichomanoides*) was the best timber for canoe-masts. The sprit had not much strain upon it, and was a much smaller pole than the mast.

The sail was made with a stout cord or bolt-rope running along all three of its edges, and it was this cord that was secured to the mast and sprit. To so secure it a strong cord or small rope was wound spirally round the pole and made fast, but at each turn this rope was inserted within the rope bordering the sail, between the rows of lacing by means of which the material of the sail was held together, or through attached cringles.

Tuta states that in former times sails were so fixed in some cases that they could be partially furled—a matter that needs corroboration. His explanation is as follows: The sprit was rolled back on the sail until the latter was reduced to the desired size, when it was secured by reef-points (? on the bolt-rope). Thus the reduced sail did not now extend down to the canoe, but only the upper portion was still spread. We await corroboration of this manœuvre before accepting it.

The other form of canoe-sail was a peculiar one, and we are not aware that it was an introduced form, but it may have been so. The *ra kaupaparu* was a true lateen sail with two booms, or whatever the correct term may be, and supported by a short mast. The sail was of the usual triangular form, but was fixed at a very low angle to the canoe. The mast was stepped in a hole made in a projecting piece in the hull of the canoe, left when it was being hewn out. (Mr. Barstow states that steps for the masts were formed in the interior of the hull when it was hewed out.) The upper sprit or yard was secured to the upright mast, and the lower one or boom left free. Thus this form of sail was quite distinct from the mast, and not attached to it as the other one, the *ra kautu*, was. It was certainly the lateen sail as seen in the Pacific.



[*H. Hamilton, photo.*

Fig. 131.—Model of a Pacific Double Canoe in Dominion Museum, showing Lateen Sail.

The sails made of *raupo* (*Typha angustifolia*) leaves were two-ply—that is, a double layer of such bulrush-leaves was employed, inasmuch as that leaf is of a somewhat fragile nature. The long lines or series of leaves were laid parallel to the sprit side of the sail, where the weaving commenced. The process, however, can scarcely be described as weaving, but is the one termed *nati* by the Maori—a method of lacing, as thatch is laced on to battens in a native hut. Two leaves were laid in position, one on the other, and at certain intervals small cords or twine passed round them to contain them; then two more leaves were added, and so on. Other leaves were added at the ends in an overlapping manner, to continue each line to the desired length, as in tying *raupo* on to

a house-wall. These lines of lacings crossed the sail and were from 2 in. to 4 in. apart. The closer together they were the more durable was the sail, for the less liable was it to be broken by winds. In some cases the sail was reinforced by means of placing cords across it and securing them to the aforesaid lacings. When not in use the sails were taken from the canoe and stored in a hut, otherwise they would soon perish by exposure to the elements. *Raupo* soon becomes very dry and brash when exposed to sun and wind. At the head of the sail the *raupo* leaves projected above the rope that connected the heads of mast and sprit, and this projecting part was cut into vandyke or rounded forms.

The sails made of *kiekie* (*Freycinetia Banksii*) and of strips of *Phormium* leaf, says our informant, were not laced together as were *raupo* sails, but plaited (*raranga* = to plait) as a floor-mat is plaited. The whole sail was not made in one piece, but in several widths, called *papa*, which were afterwards joined together, just as seen in large native-made floor-mats.

Fig. 132.—Canoe off Cape Egmont, showing Sail apparently but half-raised.

From *The New Zealanders Illustrated*, by G. F. Angas.

The capsizing of a canoe with no sail up was termed a *tahuri kokau*, and in such a case the crew would often succeed in righting her, bailing her out, and again taking their places in her. They would tilt the canoe from one side to the other rapidly and thereby get rid of much of the water. Then one would get in and start bailing, then another, and so on as she lightened. The first thing done at such times was to collect the floating items, such as paddles, bailers, &c. But when a canoe with hoisted sail capsized the doom of her crew was usually sealed, unless—as sometimes occurred, we are told—the crew managed to unship and free the mast.

When considered necessary, as in windy weather, some stone ballast might be placed in a canoe.

The remarks of Tuta Nihoniho concerning the *ra kaupaparu*, or true lateen sail, as an old Maori form, are of much interest, for it is essentially a western Pacific form, whereas the sail first described, the *ra kautu*, as depicted in D'Urville's plates, is an eastern Pacific type, though also used elsewhere. It is singular that both forms should

been used in New Zealand. The sail depicted by Angas is not the true lateen, but a half-hoisted *kautu* form, apparently. The lateen sail was extended by a yard that was suspended from the mast, as seen in the sea-going canoes of Fiji and Tonga, while the lower side was furnished with a boom, the two meeting at the tack of the sail.

In his work on *The Sailing-ship and its Story* E. K. Chatterton remarks that the lateen sail was probably adapted from an Egyptian form a few centuries before the Christian era. He also shows that the nugger sail still in use on the Nile is a transition form between the square sail and lateen. If the lateen sail originated in Egypt about that time it must shortly afterwards have been carried eastward, and thence into the Pacific. A representation of an Egyptian boat of the Fifth Dynasty shows a long sail, with a yard, that looks not unlike the triangular sail of the Pacific. Two men are using long paddles as steer-oars, and paddlers face the bow of the vessel. Some representations of larger vessels show five men steering in the same manner, while another, of the Twelfth Dynasty, shows oars in use, the paddle having disappeared.

To tack ship, or go about, is described by the term *waihape;* hence to beat against the wind is *waihapehape,* following a common law of reduplication in the Maori tongue. To sail directly before the wind is *aronui* or *whakaheke,* with the sail squared to the wind, unless the wind be considered too strong for that mode, in which case the sail is turned so as to present a smaller surface to such wind, otherwise the craft would drive through the waves instead of mounting them. To sail before the wind but a little off it is described by the expression *rere paepae.* The expression *matangirua* is applied to sailing and paddling a canoe at one and the same time.

There were two sail-tenders — one to manipulate the sheet, and one stationed at the mast to assist in turning the sail when necessary. The mast was not ascended, hence there were no ratlined shrouds such as were used in some of the canoes of the Paumotu Group.

In *Bulletin No. 2* of this series is an illustration of a Maori canoe-sail in the British Museum, where it has lain for many years. It is probably the only one in existence, and must have been obtained by one of the early voyagers in these seas. It is woven of fine strips of either *Phormium* or *Cordyline* leaves. On both sides there appears to be some form of selvedge or strengthening of the material, though no bolt-rope is discernible, and to these margins are attached a number of loops whereby it was connected with mast and sprit. No intermediate poles were used, as appear in Goldie's picture. The ridge down the middle of the sail has been caused by folding during many years. A certain amount of ornamentation appears in the zigzag pattern worked in the fabric, in the streamer or pennant, and in the feather borders. The horizontal bands seen are probably joinings of the various pieces of mat-like fabric of which the sail is composed. This is a very excellent illustration, for in it we observe a true old-time Maori sail, which is more satisfactory than any information obtainable from the present-day Maori.

This sail is depicted in Edge-Partington's *Album* (3rd series, No. 162), where its dimensions are given as — length, 14 ft.; width at top, 6 ft. 4 in.; width at bottom, 1 ft.; length of streamer, 3 ft. 6 in., width of same, 8 in.

Mr. W. H. Skinner, who examined the sail in 1908, has obliged us with the following extract from his diary:—

"British Museum, May 12, 1908.—As requested by Mr. Hamilton, I made inquiries *re* the canoe-sail. After a lot of hunting round it was found. The sail, contrary to expectations, was not of *raupo,* but of undressed flax (*Phormium*) or *ti* (*Cordyline*) leaves, in very narrow strips, not too closely woven, but sufficiently open—or, rather, close—to catch the air and yet not too close to make a heavy thing for mast of canoe and canoe itself to carry. They had succeeded in making a very strong and yet very light triangular sail admirably adapted for its purpose. The plaiting had an ornamental pattern, or, rather, scroll, running over it—nothing elaborate, but sufficient to relieve

the monotony of the fair expanse of plat; and one part of it was heavily fringed with feathers of the wood-pigeon, and also, I think, of the hawk. Along the side were inserted strong loops, finely worked, of the usual dressed flax, *muka*, for tying to the boom or light attached spar, for purpose of spreading and keeping the sail in position. It is, as far as I know, an unique specimen of the old native sail, and agrees in shape, &c., with the specimen shown in Angas's well-known plate of the large canoe sailing along off Cape Egmont."

Fig. 133.—Old Maori Canoe-sail in British Museum.

As to the streamer, or pennant, attached to the old sail in the British Museum, this was an old Maori usage, and such an appendage seems to have been known as a *matairangi*. In Marsden's account of his first visit to New Zealand he speaks of seeing ten canoes advancing in a regular line with colours flying. Presumably these colours were such appendages as are seen on the old sail.

Curiously enough, the Maori form of sail does not seem to have been in use at the Society Group in Cook's time, where the arrow-head shape obtained; but it was seen at the Marquesas, as shown in one of the plates to *Cook's Voyages*. The Tahitian sail seems to have been an intrusive form. We note this arrow-head sail in an illustration of canoes of Kenepunu, New Guinea.

An illustration of a raft of the Gambier Isles in Beechey's work shows it carrying a lateen sail. This group is one of the eastern outposts of Polynesia, and probably shows the eastern limit of this form of sail. It extends thence westward to the Mediterranean. If an old usage in eastern Polynesia, then the Maoris may have brought both forms with him when he came from that region.

Mr. Hornell has noted the triangular form of sail as being employed at the island of Bali, in Indonesia, being set with apex downward, as in Polynesia and New Zealand. He also notes their use at Madura and East Java.

Dr. Malinowski describes, in his *Argonauts of the Western Pacific*, how the natives of New Guinea rigged the triangular sail as a lateen sail.

Polack states that the Maori canoe could not beat against the wind, but could only proceed before the wind. This is scarcely correct, though the shallowness of the craft and lack of a deep keel or lee-board certainly caused them to make considerable leeway. Seafaring men tell us that a vessel rigged with fore-and-aft sails can sail nearer the wind than one carrying square sails. Would not the lateen sail of Polynesia possess

[*Sketch by Miss E. Richardson.*

FIG. 134.—CANOE OF BALI ISLAND, INDONESIA, SHOWING THE UPRIGHT TRIANGULAR SAIL OF POLYNESIA AND NEW ZEALAND.

From Hornell's *Outrigger Canoes of Indonesia;* by permission of the author.

that advantage? Polack reckoned that a canoe, presumably one of the larger ones, could be paddled at a rate of seven miles an hour. Mr. Percy Smith mentions ten miles an hour. Tupaea, the Tahitian, told Cook that their big canoes (*pahi*) sailed much faster than his ship. "All this," says Cook, "I believe to be true, and therefore they may with ease sail forty leagues a day or more."

Captain Woodes Rogers, a Pacific voyager, was at the Ladrones in the year 1710. He was of the opinion that the *proe* (*proa*, or *prau*) of that group would sail at the rate of above twenty miles per hour. Anson puts it at nearly twenty.

An experiment was made at Portsmouth, subsequent to Commodore Anson's voyage, with a *proa* built there in imitation of the Ladrone *proa*, and her swiftness is said to have been wonderful, but the rate of her sailing is not specified.

In spite of some contradictory statements, it appears that the Maori canoe could sail fairly close to the wind, but made great leeway, owing to lack of a deep keel or lee-board, and that they were not well adapted for running directly before the wind in a seaway.

The use of several steering-oars probably had the effect of preventing the making of leeway to some extent. These long-bladed oars would act as lee-boards. In writing of Tahitian canoes Ellis remarks: "In long voyages they have two or three steering-paddles, including a very large one, which they employ in stormy weather, to prevent the vessel drifting to leeward."

In his paper on Polynesian settlements in Melanesia Mr. C. M. Woodford, C.M.G., describes how canoes of the North Pacific beat up against the wind: "When I visited the Gilbert Group in a sailing-ship from Fiji we had to go from the island of Kuria to Apamama, a distance of only about fifteen miles to windward, and against a strong current running to the westward. We had to go from Kuria, which lies in about 30′ N. lat., into about 4° north in order to get to windward of Apamama, an operation which occupied us nine days. The morning we arrived at Apamama nine large canoes, one of them over seventy feet long, arrived from Kuria, having beaten up during the night, against the wind and current. . . I should, however, explain that the Gilbert Island canoes appeared to me to be much more weatherly than the canoes of central Polynesia, and to make scarcely any leeway when sailing by the wind. In the Samoan and Tongan canoe the bottom was round without keel. The Gilbert Island canoes, on the other hand, had a sharp keel, and a better grip of the water."

A model of a canoe of the Gilbert Isles in the Dominion Museum shows an extremely sharp keel, differing widely from our Maori canoes.

Writing of the *proa* of the Ladrones, Anson remarked: "By the flatness of their lee side and their small breadth they are capable of lying much nearer the wind than any other vessel hitherto known, and thereby have an advantage which no vessels that go large can ever pretend to. The advantage I mean is that of running with a velocity nearly as great, and perhaps sometimes greater, than that with which the wind blows."

In *Crozet's Voyage* the rate of sailing of the canoes of Guam is given as three leagues an hour with a fresh wind, and five leagues with a strong wind: hence, the writer remarks, they are the best sailers amongst the small sea-going craft known.

Captain Berry has stated, in his *Reminiscences*, that the Fijian canoes could sail at the rate of fifteen miles an hour, and lie within three points of the wind.

In his work on the natives of northern Borneo Mr. Ling Roth tells us that the Dyaks paddle their canoes, in smooth water, about six miles an hour, "but when exerting themselves fully can double that rate of speed." He also remarks that the Kayans use a long boat cut out of the trunk of one of the large forest-trees, sometimes measuring 38 yards in length, and 7 ft. in beam. "A boat of this description will accommodate a hundred men, who sit two abreast, plying their paddles on either side of the boat simultaneously; and thus propelled it attains a rate of speed enabling it to travel, at a rough calculation, between fifty and sixty miles a day."

In an account of the voyage of the "Dolphin" (under Commodore Byron) round the world in 1764–65 occurs the following description of the swift, canoe-like *prau* of Indonesia: "These vessels move with such amazing swiftness that it is generally allowed by all who observed them with attention that with a brisk trade-wind they will run at least twenty miles an hour. . . These vessels, with either end foremost, can, with amazing swiftness, run from one of these islands to another, and back again, without ever putting about."

In *The Travels of Peter Mundy*, published by the Hakluyt Society, appears an illustration of double outrigger canoes as seen on the coast of Sumatra in 1637. The following remarks are made concerning them:—

"Prowes of greatt Swifftnesse: Here are some prowes of such exceeding swifftnesse in a gale of wind thatt it [is] allmost incredible, a man standing to windward to Keepe her upprightt, that the Crossebarres come nott much into the water. For the outer barres of all are to keepe her from oversetting, which shee would otherwise bee subject unto, beeing soe long and narrow to beare such a saile, which is allsoe the Cause of her swifft motion. I say her greatt length and soe little breadth with a saile soe unproportionably wide."

In his account of the Tongan Group Cook writes: "I have mentioned that Fiji lies three days sail from Tonga-tapu, because these people have no other method of measuring the distance from island to island but by expressing the time required to make the voyage in one of their canoes. In order to ascertain this with some precision, or at least to form some judgement, how far these canoes can sail in a moderate gale in any given time, I went on board of one of them when under sail, and, by several trials, with the log, found that she went seven knots or miles in an hour, close-hauled in a gentle gale. From this I judge that they will sail, on a medium, with such breezes as generally blow in their sea, about seven or eight miles in an hour. But the length of each day is not to be reckoned at twenty-four hours. For when they spoke of one day's sail, they mean no more than from the morning to the evening of the same day, that is ten or twelve hours at most. And two days' sail with them signifies from the morning of the first day to the evening of the second, and so for any other number of days." Elsewhere, in describing his movements within the Tongan Group, he remarks: "Amongst these canoes there were some double ones, with a large sail, that carried between forty and fifty men each. These sailed round us apparently with the same ease as if we had been at anchor."

Cook also shows that the Tongans were in the habit of voyaging to Hamoa (as they styled Samoa), which they told him was two days' sail distant.

Shortland, in his *Traditions and Superstitions of the New-Zealanders*, speaks of a sixty-mile coastal trip by a canoe during a gale in the Bay of Plenty in 1844: "About nightfall, when the gale was at its height, I was startled by hearing the shouts and exclamations of many voices uniting with the roaring of the wind. What was my surprise to learn that a canoe had just arrived from Opotiki, a place distant about sixty miles to the eastward. . . The event appeared to me so marvellous that I went early the next morning to see the canoe and its crew, to be better assured of the fact. The canoe I found hauled up on the beach as far as high-water mark, with the cargo, consisting of baskets of *kumara* and potatoes, still on board. It measured about forty feet in length, with an extreme width and depth of about five feet. The hull or lower part was formed from the trunks of two trees, dovetailed together after the peculiar method of the country. . . Above this was fastened a topside or gunwale [top-strake] of the usual width of about ten or twelve inches. There was no protection against the break of the sea except that offered by a sort of deck constructed of *raupo* or flax, by which the bow was covered in a temporary manner for a few feet, a safeguard generally adopted when making coastal voyages of any length. The crew, nine fine able-bodied fellows, were seated on the ground, with a numerous crowd round them listening to their account of the near escapes they had had on their voyage."

In 1865 the pro-Government natives of the Ngati-Porou Tribe captured five canoes from rebel natives at Uawa and sailed them up the coast. The masts were set up in a vertical position, and the sprit obliquely in the old way, though the sails employed were rectangular floor-mats with a sheet attached to the loose lower outside corner.

Poling or Punting.

The propelling of canoes by means of a pole is a common Maori practice, and is resorted to in traversing rivers up-stream. Most of our rivers have swift currents; the majority of those traversable by canoes do not show a current moving at a uniform

rate, but alternate rapids and reaches in which the current is slow. In poling a canoe up a rapid strenuous exertion is called for, as also a considerable amount of dexterity in the use of the punting-pole. Two methods of manipulating the pole are employed. In one the punter thrusts his pole down by the side of the canoe until it strikes the bottom, and then, standing still, bears heavily down on the pole: as the canoe forges ahead he allows the pole to pass through his hands until he is grasping its extreme end; he then recovers it, pulling it in and making a fresh thrust. In the other method he makes his thrust near the bow of the canoe, and, as the craft moves ahead, he walks toward the stern, on reaching which he hauls in his pole and goes forward to make another thrust. When a single individual is poling he uses his implement on both sides of the canoe, as a single paddler does. In poling against a swift current concerted action is necessary, and it is a most interesting sight to witness expert punters forcing a big canoe up a rapid. The natives of the Whanga-nui valley are reckoned the most expert hands at punting. This river has ever been their principal highway, and their villages are situated on its banks, from which rise steeply rugged and broken hill formations.

[*Muir and Moodie, photo.*

FIG. 135—CANOE-POLERS, WHANGA-NUI RIVER.

A photo taken of natives poling a canoe up a rapid of the Whanga-nui River has unfortunately been mislaid.

The following experience by Wakefield in the "forties" of last century is of interest: "On reaching the foot of the rapid the crew abandon the paddles, stand up in the canoe, and handle long poles made of *manuka*, *toatoa*, or other hardwood, and charred at the lower end. They now push against the bed of the river in perfect unison, as though by clockwork. The helmsman also steers with a pole, balancing himself in the high-peaked stern, and guiding the canoe by poling under or away from it. The silence is only interrupted by the grating of the poles against the sides of the canoe, and the foaming of the water, or by an occasional brief word of direction from the man in the bow—'*Ki uta*' ('Towards shore'), or '*Ki waho*' ('Outwards'). The canoes follow each other in single file, with scarcely two feet between the stern of one and the bow of the next; and though a collision would in most cases render the capsizing of both inevitable, such is the skill of the natives that an accident rarely occurs in going up the rapids. The natives of Whanga-nui have a known reputation for this peculiar exercise; and men of other tribes poling on the river are much laughed at for their awkwardness, and the numerous duckings they get in consequence. A crew of experienced Whanga-nui natives poling up a strong rapid is a very pretty

sight. As it is hard work, they generally strip, leaving only a shirt or mat around the waist, and the exercise throws them into the most graceful attitudes and develops their muscular energy. A by-word alludes to the known practice in poling, while it mimics the uncouth dialect of this tribe. After I became, as it were, identified with them, it was often shouted after me by the Kapiti and Ngati-Awa natives—'*Ira! Ira! E weke! E toko ki Tuhua*' ('Hallo! old man! Pole away inland to Tuhua')."

The Whanga-nui natives do not keep thrusting on the pole and keep stepping towards the stern of the canoe—that is, letting the canoe pass forward under them—but remain standing in the same place and frequently shift the pole. The pole is termed *toko* and *panoho*.

[*Sketch by Miss E. Richardson.*

FIG. 136.—THE TO'O HUE OF TAHITI.

A peculiar form of punting-pole used in deep water.

Poles of *ramarama* (*Myrtus bullata*) were highly prized by canoemen of the Whanga-nui River, on account of their toughness. Poles of *kopuka* (*Leptospermum scoparium*) were also, and more commonly, used. Stronger and heavier poles were used by the polers at the bow of a canoe than were employed by those at the stern. Lighter poles were used by women. In ascending swift rapids, two or three men sometimes manipulated each pole.

In describing a trip up the Rangi-tikei River in a canoe, made by him in 1839, Missionary Williams says: "Dec. 9: Proceeded up the river in canoes, the current so extremely strong that the natives were obliged to pole the canoe, requiring the greatest care that our bark should not be upset. So irregular was the surface of the current that at times it ran more than a foot higher than our canoe. I kept my eye upon our boatmen, who appeared perfectly composed, and aware of what they are about; I therefore kept myself perfectly quiet."

The word *toko* (a pole) is also used as a verb—to punt or pole with a *toko*. It has the same double meaning in the Samoan, Tahitian, Tongan, and Mangareva dialects, To allow a canoe to drift with the river-current is expressed by the word *tuku*, as in the expression "*He waka tuku ki tai.*"

A Tahiti-French half-caste named Hiro Coppeurath has given me an interesting item regarding the poling or punting of canoes in deep water as formerly practised by the natives of Tahiti. This method was followed in propelling double canoes, and is known as *to'o hue* (Maori, *toko hue*), or gourd-pole. The paddlers were often assisted by men stationed on the elevated platform, each of whom manipulated a pole, on the bottom end of which was secured a gourd (*hue*). These poles, with attached gourds, were used as in ordinary punting, being thrust downward, the gourd itself providing the resistance. These gourds were thrust downward into the water by the operators, acting in unison, much as persons do when poling a canoe up a stream. By means of the pressure thus produced two results were attained—the canoe was uplifted bodily so as to be not so deep-sunk in the water, and it could also be forced ahead. These *toko hue* called for skilful manipulation and a considerable amount of muscular strength. Their use much increased the speed of the vessel. Again, when such a canoe was swamped, the manipulators of the *toko hue* all forced their implements down vertically into the water,

and so contrived to lift the vessel so that the gunwale was above water, whereupon the crew set to work at bailing out the water.

When coasting these poles were reversed, and the other ends thereof used as ordinary poles, as we see among the Maori. The end of the pole was inserted in the gourd, and the latter rendered watertight in some way.

A further communication from Hiro furnishes the following notes: The *to'o hue* called for very careful work in its construction, otherwise the fragile gourd would be broken. In order to avoid such a breakage by the thrust of the pole, a kind of netted bag was inserted in the gourd and attached thereto. Into this the end of the pole was inserted, and then some kind of vegetable gum was used as packing, which, when it became set, gripped the pole-end and prevented any looseness or movement of the gourd, as also closing the aperture so that no water could enter the gourd. The latter was also covered with a netted fabric that preserved it from fracture if knocked against any timber, as the side of a canoe.

It is said that these peculiar implements were sometimes employed at sea as in rough weather, whereby to render a canoe more buoyant. A number of them would be thrust deeply into the water in a vertical position, and the upper ends of the shaft lashed firmly to the canoe. This is said to have had the effect of lifting a double canoe to an appreciable extent.

It is an old jest among our Maori folk that when drifting down a river one can get plenty of companions, but it is different when a trip entails strenuous poling up-stream against a strong current. Hence the old saying, "*He waka tuku ki tai, tururu ana nga tangata o runga; he waka toko, tau ana te kohakoha.*"

Probably no people surpass, or even equal, the river Dyaks of Borneo as canoe-polers up rough rivers. To such men our Whanga-nui rapids would be very ordinary obstacles.

Anchors.

Mr. Barstow, in his paper on the Maori canoe, discourses as follows concerning anchors: "Of these there were three varieties: an oblong stone, with a hole through the smaller end; a stone enmeshed in a netting of flax or vines; or three or four crooked pieces of *pohutukawa* (*Metrosideros tomentosa*) lashed together with a stone between the shanks and the curved points, forming a rude grapnel." There were, however, one or two other forms, as we shall see anon. Polack remarks that "Canoes are generally anchored by filling a basket with one or more large stones or a heavy piece of wood." And again, "As we had met with some difficulty in pushing off our canoe from the last place we had stopped at, I had the vessel anchored off by filling a basket with heavy stones attached to a native warp made of flax." The use of wood with no stones attached as an anchor has not been recorded elsewhere, but the stone or stones in a basket or with a netting round them is a recognized form. Mr. Matthews writes as follows: "The large, smooth, oval stones used as anchors were now sorted out, netted over, and each supplied with ten or twelve fathoms of rope." In some cases large waterworn stones had grooves pecked round the middle to accommodate the rope cable to which they were tied. This form seems to have been common on the west coast of the North Island. It agrees with the form of stone sinkers common on the Taranaki coast.

The Rev. T. G. Hammond states that stone anchors were common about Patea some years ago: "They weigh from ten to twenty pounds. Nature has fashioned some ready to hand, but others have been formed by cutting a space right round the stone to keep the rope in position. They are variously shapen and of different qualities of stone." (See fig. 138, p. 194.)

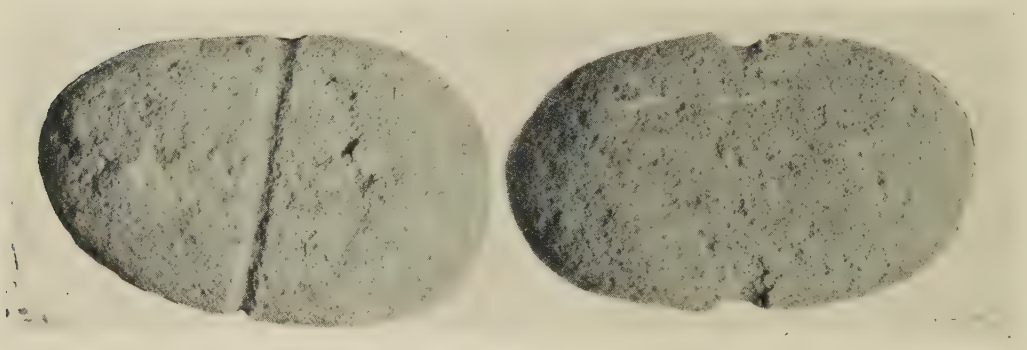
Mr. T. W. Downes informs us that he has seen many old stone anchors on the banks of the Whanga-nui River, many having been collected by workmen on the river-improvement works and used in constructing walls of stones in the river.

The anchor of the "Tokomaru" canoe, that came from eastern Polynesia to New Zealand some centuries ago, is said to be still preserved in the Mokau district. Mr. Skinner described it as follows: "The anchor is a large stone, and stands about

[*Sketch by Miss E. Richardson.*

FIG. 137.—A MELANESIAN FORM OF ANCHOR.

A wickerwork crate filled with stones. From *Melanesians and Polynesians*, by George Brown.



[*H. Hamilton, photo.*

FIG. 138.—TWO CANOE-ANCHORS (MAORI FORMS).

Waterworn stones grooved to accommodate the cable. Specimens in Dominion Museum.

three feet high, and weighs from three to four hundredweight. It is pierced for a cable; the first hole made had broken out, and they then bored another across the grain of the stone."

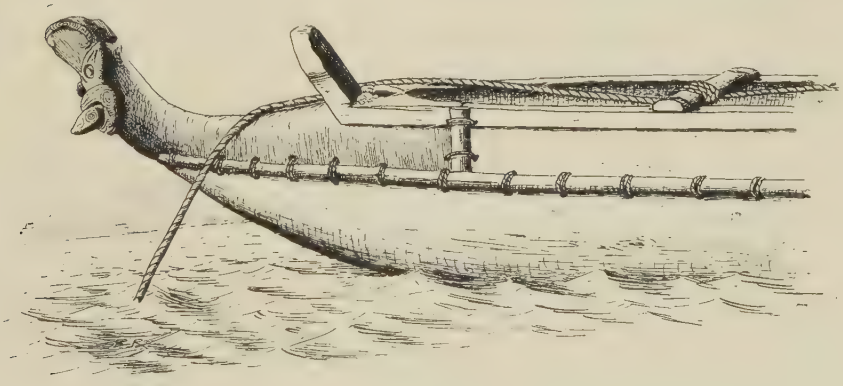
The following notes on stone anchors were contributed by the late Tuta Nihoniho :—

Large canoes were provided with two stone anchors. These were of different forms; some had holes to put the rope through (see fig. 139), and others were smaller in the middle than at the two ends, which provided a good place whereat to tie the rope. The rope used as a cable was made from leaves of the *Cordyline*, a more durable material than *Phormium*.

[*W. R. Reynolds, photo.*

Fig. 139.—Stone Anchors from Tauranga, in Auckland Museum.

Two *punga kowhao* pierced for cable. The unpierced specimen shows an incised scroll design.



[*Sketch by Miss E. Richardson.*

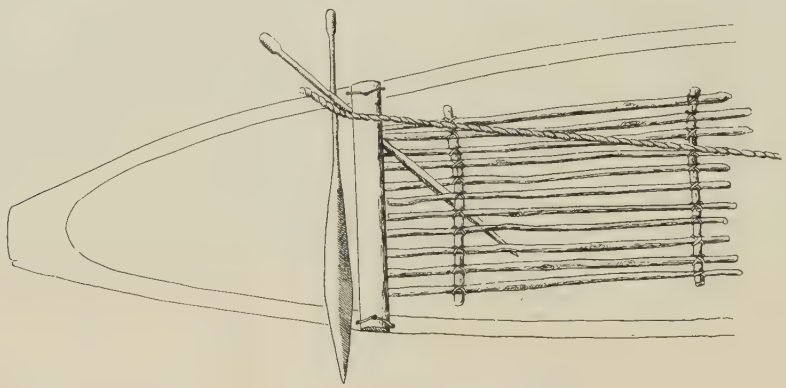
Fig. 140.—Diagram showing Method of anchoring a Fishing-canoe.

(See p. 196.)

The leaves of *Cordyline australis* (the common "cabbage-tree") were plucked, dried, then steeped in water for a time, then plaited into a rope by the *rauru* method of five strands. When a canoe was provided with two anchors, one was kept at the bow, the other at the stern; but when both were used in anchoring, then both ropes were secured to the

bow-thwarts. A fishing-canoe usually had one anchor, and when at anchor the cable thereof was brought up on one side of the carved head on the prow of the vessel, passed over behind the head, through the hollow between it and the projection on the hinder part of the figurehead, round that projection, and so on to the first thwart, where it was secured. (See fig. 140, p. 195.) The figureheads of these fishing-canoes are of a form very different from the elaborate prows of war-canoes.

When about hauling up a heavy anchor, a number of men have to pull on the rope thereof, and, as a sufficient number of men for this purpose cannot grasp the rope for a straight hoist, the following expedient is resorted to: A paddle is thrust, blade downwards, through the flooring, with its point behind the *tokai* or behind one of the cross-pieces supporting the floor, the upper and round part of the paddle resting on the gunwale and close against the thwart. Another paddle is laid horizontally across on the two gunwales and close against the other paddle. The rope cable is laid on this latter paddle, close against the slanting one, and the slack passed down the middle of the canoe; hence all hands can tail on for the haul. The rope runs in the angle made by the crossing of the handles of the two paddles, which, being jammed, prevent it sliding along the side of the canoe when hauled on. When the anchor was hauled up to the top board of the canoe, a stout pole was thrust through a loop of strong rope on the upper part of the



[*Sketch by Miss E. Richardson.*

Fig. 141.—Diagram showing Method of hauling up a Heavy Stone Anchor.

anchor, then a number of men grasped the pole on either side of the anchor, and so lifted it inboard, where it was placed in the middle of the hold. The rope was then detached and coiled up carefully, so that, when the anchor was again cast over, its rope would run free, without hitch or snarl.

The anchors of important canoes had special names given them, and some of the names of those of the canoes that arrived here from eastern Polynesia twenty generations ago are still preserved.

In some cases another form of anchor was used, consisting of a stone the length of which was much greater than its breadth. To this stone two short stout poles were secured by strong lashings in the form of a cross, and a stout piece of rope fastened round the middle of the stone, with a loop on one side to which the rope cable was attached. (See fig. 142, p. 197.) It is said that the four projecting pole-ends served to a certain extent as do the flukes of our anchors, and, by sinking in mud, &c., furnished additional holding-power. These cross-pieces were on the underneath side of the anchor when it was lowered; thus the weight of the heavy stone upon them tended to cause them to sink in mud.

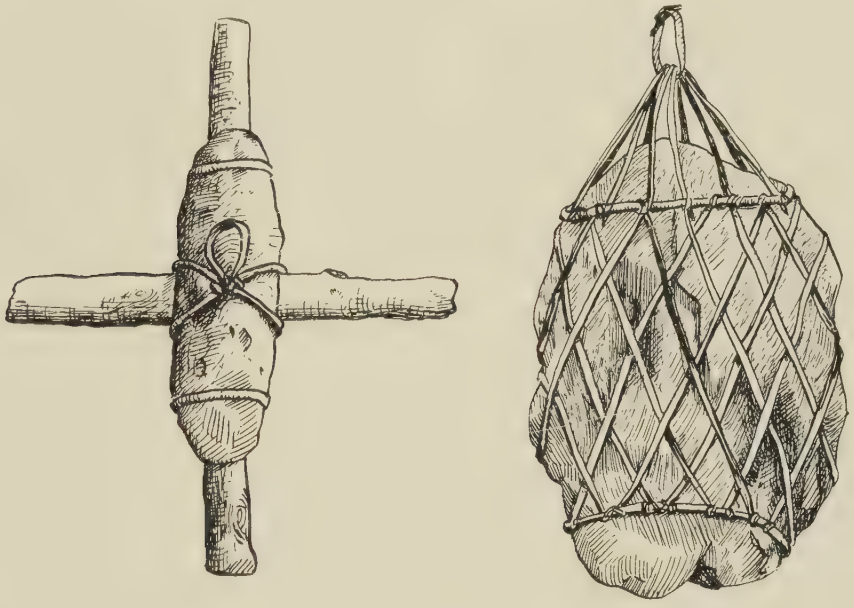
In some cases a canoe would anchor in order to ride out a gale, and in such cases the crew stationed themselves towards the stern, so as to keep the bow of the canoe well up.

Not only did all canoes receive special names, but in the case of important canoes the sails, cordage, masts, anchors, paddles, thwarts, bailers, &c., were also named in a similar manner. The names given were sometimes those of tribal ancestors, sometimes those of famed natural features of the tribal lands, as mountains, ranges, and rivers.

The large stern anchor was called the *punga whakawhenua*, and the smaller bow anchor was the *punga karewa*, or *korewa*. One or both of these might be used.

Nihoniho does not state that stones used as anchors were ever pierced by hand in order to facilitate attachment to the cable, and apparently this was not often done. Suitable stones were occasionally found provided with a hole produced by natural processes.

Here follow a few anchor notes from Wai-rarapa natives: Some anchors were simply large rounded stones having no hole for passing a cable through, but they were enclosed in a kind of network of strong cords. (See fig. 142.) A hoop of *aka* (stem of a climbing-plant) was made, being of a less diameter than that of the middle part of the stone, and on this hoop the stone was placed. Strong cords, attached by one end to the hoop, were brought up over the stone—not straight up, but crossing each other diagonally



[*Sketches by Miss E. Richardson.*

Fig. 142.—Two Forms of Anchors.

so as to resemble network—and were drawn taut and tied to a similar hoop placed on the top of the stone, the loose ends then being twisted together and formed into a loop to which the cable was secured. This cable often consisted of the tough pliant stems of a forest climbing-plant called *aka kuku*. The cords forming the network were termed *kawekawe*.

In some few cases stone anchors belonging to noted chiefs had incised patterns on them, such pattern being invariably that known as *rape* (a spiral). And it would be said, "*Ko te punga o te waka a Mea, he rape.*" Thus fame was achieved. Such an anchor would also have a special name assigned to it.

The stern anchor of the "Takitumu" canoe was named "Toka-ahuru," and that of the bow "Matakana." After these two anchors were named two *hapuku* (cod) fishing banks or rocks situated at Tauranga and Nukutaurua.

The bow anchor of the "Arawa" canoe was named "Toka-parore"; the stern anchor was "Tu-te-rangi-haruru."

The generic term for anchors is *punga*, and on deep-sea voyages, such as those made from and to Polynesia in former times, three different kinds of *punga* were carried on every vessel, according to tradition. These three types were as follows:—

(1.) *Punga whakawhenua:* Heavy ground or holding anchors, used in anchoring the vessel.

(2.) *Punga korewa* (occasionally termed *punga tarere*): Sea-anchors. These were lowered a certain distance for the purpose of steadying a canoe in a rough sea. A lighter stone than No. 1.

(3.) *Punga terewai:* A much lighter, smaller stone, used in sounding, and in ascertaining the set and strength of currents; hence described as a *punga tutoro*. *Punga* here should not be translated as "anchor."

I have also been told that the heavy form of anchor (No. 1) was sometimes employed as a sea-anchor when riding out a gale, being lowered at the stern of the vessel in order to both steady the stern and lift the bow.

As the stern of the ocean-going vessels was higher out of the water than the bow, the former part was swung round in some cases to meet a gale at sea. This was effected by lowering the stern anchor to a certain depth and allowing the bow to swing round. This often prevented a canoe filling with water by dipping her bow into it, or by the waves breaking over the bows.

Mr. Colenso tells us that the rope used for attaching to anchors was a four-sided or square one; this was made of the unscraped leaves of the cabbage-tree, that had been gathered and carefully wilted in the shade, and then soaked in water to make them pliant. It was used for their anchors, and other heavy canoe and house requirements. The leaves of the flax would not be suitable for such a purpose. It might be added that the fibrous leaves of this *Cordyline* are much more durable than those of *Phormium* (flax), hence they were used for many purposes.

Drift-anchors were employed by the natives when fishing off the coast. These were stones of no great size, lowered a certain distance so as to cause the canoe to drift slowly. This was done in order to locate a good fishing-ground. When so found, then the anchor was lowered and the drift stopped.

The huge stone anchor in the Dominion Museum is said in Maori tradition to have been that of "Matahorua," the vessel of Kupe, the Polynesian voyager who discovered New Zealand many centuries ago. (See fig. 143, p. 199.) This vessel is said to have had two *haumi tuporo*, or square-butted pieces, to lengthen her hull, and two anchors with holes in them to receive the cables — "*he punga kowhao te maunga taura.*" (See fig. 139, p. 195.) One of these anchors was a stone of a brown or reddish colour, resembling the *kiripaka*, or matrix in which the flint-like stone known as *mata waiapu* is found embedded, a kind of stone known or described as *puwaikura*. This was brought from Rangiatea. A stone of this kind was brought to this land in the "Kura-hau-po" canoe by Tama-ahua, and it was used as a *whatu*, or talisman, and buried beneath the posts of a house at Taranaki. The other anchor of "Matahorua" was of the kind of stone known as *tatara-a-punga*, and it was procured from a hill or range named Maungaroa, at Rarotonga, hence this anchor was called "Maungaroa." Kupe is said to have found at Porirua a stone of the kind known as *huka-a-tai*, which he utilized as an anchor, and took back with him to Rangiatea, in the eastern Pacific, as a proof, it is said, of his having reached a new land. He left "Maungaroa" at Porirua, where it lay throughout the centuries, ever respected by succeeding tribes as a relic of their daring ancestor Kupe, of "Matahorua." It lay at the old village-site at Paremata, north of the bridge and just east of the railroad-track. The Imperial troops stationed at the stone redoubt west of the line broke a piece off the stone, an act that angered the natives. When some of those soldiers were accidentally drowned in the harbour some time afterwards the natives at once said that it was a punishment for the act of sacrilege. This anchor

was seen at Paremata by the writer many years ago, and in later years the natives were induced to allow it to be placed in the Dominion Museum.

Such is the story of "Maungaroa" as believed by the Maori, and it is assuredly an interesting one. It may, however, be a myth that has grown up round this stone in the course of centuries, or it may be partially true—a story attached to the wrong stone. The stone is a big waterworn boulder of a local greywacke, apparently, which waterworn stones are found in great numbers on Wellington coast-lines, and many are seen in middens and at the site of long-abandoned native villages. This stone would presumably not be found on the volcanic island of Rarotonga. Moreover, it is too big to serve as an anchor; a stone measuring about 20 in. by 21 in. is too heavy and cumbrous for a canoe-anchor, and could only be handled on a big double canoe, certainly not on a single one. The pierced hole at one corner bears the appearance of being a natural formation; a smaller cup-like hole is seen on another surface.

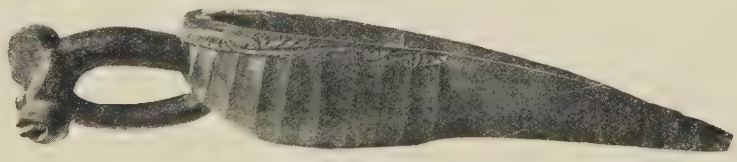
[*Sketch by Miss E. Richardson.*

FIG. 143.—TE PUNGA O "MATAHORUA" (THE ANCHOR OF "MATAHORUA").

Now in the Dominion Museum.

A stone anchor for a river-canoe from Whanga-nui is 16 in. long, 7 in. wide, and 5 in. thick—a piece of rough shell conglomerate. Four others are somewhat smaller, and one is larger. All show pecked transverse grooves to accommodate a rope.

When the "Tainui" canoe arrived here from Polynesia about five hundred years ago her crew settled principally at Kawhia, where they found a people known as Ngati-Hikawai living. One of the crew, Kopuwai by name, took the canoe on to Mokau, where he settled with his family. Hoturoa, the chief man of the immigrants, had the canoe taken back to Kawhia and hauled up on land. He had a stone set up at the bow, and another at the stern, in order to mark the length of the vessels, which stones still stand there. That at the stern was named "Hine," that at the bow "Puna," after the two stone anchors of "Tainui," one of which had been left at Mokau.



A CAREFULLY FASHIONED BAILER OF INFERIOR TYPE.

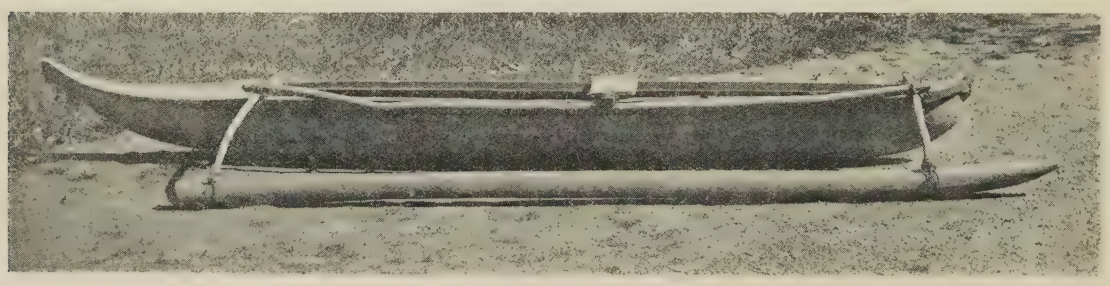
PART VI.

CANOES OF THE PACIFIC AREA.

CONTENTS.

Prototypes of Maori vessels. Distribution of different forms. Australian canoes. Double outrigger. Possible evolution of ordinary Maori canoe from outrigger and craft with balance-platforms. Superiority of Polynesians as navigators. Polynesian canoes. Canoes of Cook Group. The *pahi*. Double canoes. Canoes of Mangaia. Curious steering-device. Canoes of Niue. Canoes of Manihiki. Canoes of Austral Isles. Canoes of Tongareva. Canoes of Ellice Group. Canoes of Easter Island. Canoes of Society Group. Canoes of Paumotu Group. Canoes of Marquesas Group. Canoes of Hawaiian Isles. Canoes of Tonga Group. Canoes of Samoan Isles. Melanesian canoes. Canoes of Fiji. Canoes of New Hebrides. Canoes of Santa Cruz Group. Canoes of New Caledonia. Canoes of Solomon Isles. Canoes of New Ireland. Canoes of Admiralty Isles. Micronesian canoes. Canoes of Caroline Group. Canoes of Ladrones. Outrigger of Ceylon and India. Deep-sea vessels mentioned in Maori tradition. Management of same. The double outrigger. Compass-points and wind-names.

THE prototype of the Maori canoe must be sought in the Pacific, for the Maori was an immigrant from Polynesia. The outrigger canoe we shall find in most parts of the Pacific. The double canoe, though less widely used, is, or was, employed in many places. The single canoe without outrigger is the rarest form in the Pacific, but is more



[*F. J. Denton, photo.*

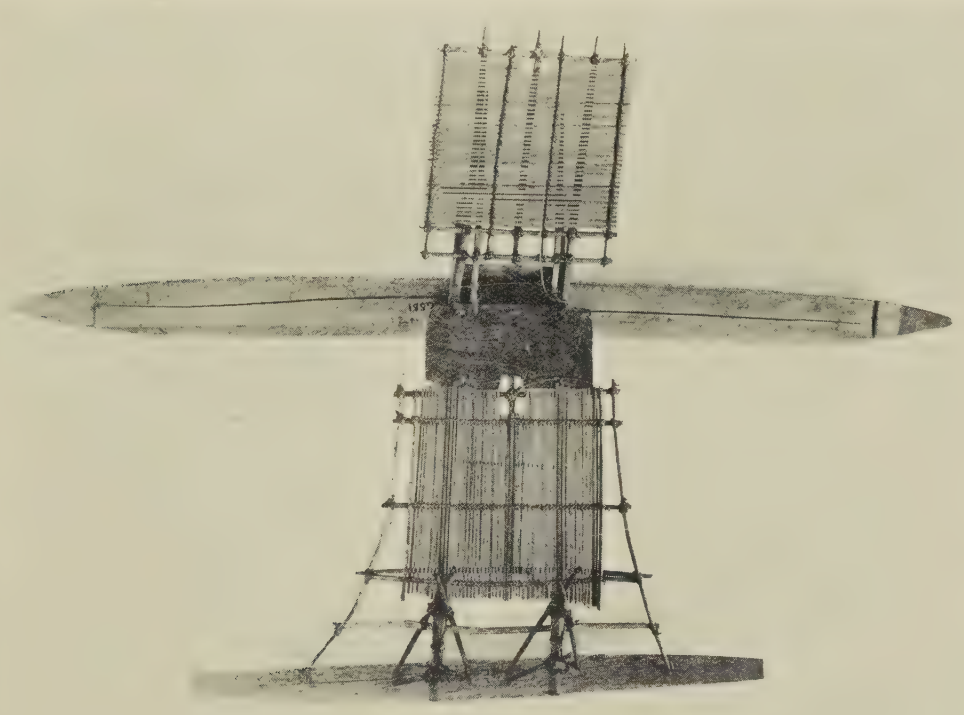
FIG. 144.—A DIMINUTIVE OUTRIGGER CANOE FOR RIVER USE, IN WHANGA-NUI MUSEUM.

Illustrates direct attachment of booms to float.

common in the west. It has been noted near Ternate, at the Solomons; and among the peoples of south-east Asia a similar form obtains; indeed, a craft resembling in form the Maori canoe is used in the Persian Gulf region.

The outrigger is found as far westward as Ceylon, and Indian records show that it has been used on that coast from very early times. Its eastern limit was Easter Island. Outside of this area the outrigger seems to have reached but one region, the east African coast and Madagascar; and this singular extension of its range may be connected with the Polynesian element in the Malagasy speech of Madagascar.

The outrigger was apparently an introduced feature on northern Australian coasts. The canoes of the Australian natives seen by Cook on his first voyage, when he sailed along the east coast of that land, were of two kinds. Towards the south the canoes were very crude, for they were "made of one piece of the bark of trees about twelve or fourteen feet long, drawn or tied together at one end." As a rule these held but one man. "The few canoes we saw to the northward were made out of a log of wood hollowed out, about fourteen feet long and very narrow, with outriggers; these will carry four people. . . . Bad and mean as their canoes are, they at certain seasons of the year go in them to the most distant islands which lay upon the coast. . . . We were surprised to find houses, &c., upon Lizard Island, which lies five leagues from the nearest part of the main." Fig. 144 shows a diminutive form of outrigger canoe, such as are used for lagoon and longshore work.



[*H. Hamilton, photo.*

FIG. 145.—MODEL OF CANOE WITH OUTRIGGER AND BALANCE-PLATFORM.

Specimen in Dominion Museum. Locality unknown. No record.

The double outrigger has a much more restricted range than the single attachment. It is met with in Indonesia, in the Louisiade Archipelago, in parts of New Guinea, Melanesia, in the Sulu Archipelago, and in the African area alluded to. In writing of the natives of Torres Straits, Dr. R. W. Coppinger remarks in his *Cruise of the "Alert,"* 1878–82, "Their boats are long dugout canoes, fitted with double outriggers, and very rudely constructed. Whether under sail or paddle, they manœuvred very badly."

The same writer saw the double outrigger north of the eastern end of Java: "We passed through the strait which separates the islands of Sapodie and Madura, and as we emerged from its northern outlet found ourselves in the midst of a large fleet of Malay fishing-boats, of which no less than seventy were in sight at one time. These

boats were long, narrow crafts, fitted with double outriggers, and having lofty curved prows and sterns. They carried a huge triangular sail, which, when going before the wind, is set right athwartships with the apex downwards, and when beating seemed to be used like a reversible Fiji sail."

In this account we recognize the true Maori and Polynesian sail, and these vessels, with high stern and stern-pieces, remind us of the Maori canoe.

Colonel Fox tells us of single outrigger canoes of Samoa, New Guinea, and the Solomon Isles so constructed as to allow of them sailing one way only. This means that the outrigger would sometimes be on the leeward side; hence a platform was constructed so as to project out on the opposite side of the canoe, and on this men stationed themselves when necessary to counterbalance by their weight the effect of the wind. Again, in certain parts of the Asiatic Archipelago, a form is used in which the canoe has greater beam, and is provided with such a projecting platform on both sides, but no outrigger, which has become, as it were, atrophied. Obviously the next step is to increase the beam of the vessel and so make it independent of the two balancing-platforms, which brings us to the ordinary type of Maori canoe. Fig. 145 shows the balance-platform of a single outrigger canoe.

Woodford, author of *A Naturalist among the Head-hunters*, writes as follows: "One of the most marked distinctions between Melanesians and Polynesians resides in their canoes. The Melanesian does not venture far out to sea in his canoe; and although in the Solomons the natives make voyages from island to island of two or three hundred miles, these are entirely within the group, and performed exclusively with paddles, sails not being used at all. Indeed, I suppose the Solomon Island canoes never go out of sight of land." This writer describes the canoes of the New Hebrides group as "wretched affairs," totally unfitted for any extended voyage. C. Hedley, in his paper on Funafuti, remarks, however, that "I am informed that large, well-built canoes exist on Mallicolo." Woodford continues: "The Polynesian is eminently a navigator, venturing far to sea and making considerable voyages out of sight of land in his large outrigged or double canoe, with its enormous triangular sail."

The following remarks on outrigger and double canoes of Polynesia are taken from Mr. C. M. Woodford's paper on Polynesian settlements in Melanesia: "The Polynesian canoe was fitted with an outrigger of light wood. This was, according to my observation, about two-thirds the length of the main canoe, and fixed at a distance from it of about one-third of the length of the canoe. It was always kept to windward, so that in going about the canoe had to change ends, the bow on one tack becoming the stern on the other. Subsequently the idea of substituting a second and slightly smaller canoe for the outrigger was introduced in Polynesia for the largest sailing-canoe. This rendered the whole much more stable, as there was no risk of a capsize either by submersion or elevation of the outrigger, contingencies both of which had to be guarded against in the outrigger canoe. There is no doubt that the Tongans and Samoans in their piratical excursions to distant islands used the double canoe in preference to the outrigger; and, in fact, it was impressed upon me at Sikaiana that, in speaking of the visits of the Tongan canoes, the two were lashed together, making one double canoe." Woodford also remarks that "Information obtained by me tends to the conclusion that, as late as one hundred years ago, the Polynesians were still in the habit of making long voyages to distant islands."

It will be noted that the greater part of the detailed information concerning the canoes of the Pacific area contained in this paper has been culled from the works of early writers, in many cases the earliest writers on subjects connected with that region. It is a curious and suggestive fact that the early voyagers give, in many cases, more detailed and satisfactory descriptions of native arts and industries than did the men who came after them, although the latter had better opportunities for conducting observations.

Polynesian Canoes.

Canoes of Cook Islands.

Of the canoes of central Polynesia F. J. Moss writes: "The canoe is a very frail affair, always with an outrigger, and varying only in shape and size. Neither nails nor metal fastenings are used. The planks are fitted very neatly. . . . Some of the canoes, though narrow, are of considerable depth, and the outrigger enables them to carry very large sails of the leg-of-mutton shape. With these they sail very close to the wind, but make great leeway." It should be made clear that the modern single canoes are here spoken of; double canoes, such as those of Atiu, were not, of course, fitted with outriggers. The model of a double canoe from the Cook Group shows two hulls with deep keels and having a small platform between them. One end of each canoe has a sharp-pointed, plain prow, while the other end has a vertical projection on it. But these ends of the two hulls do not point the same way: they are reversed. Model canoes, however, are not reliable illustrations, as a rule, not being made to scale. The *pahi*, or big double canoes of the Cook Group, were used in ocean voyages and inter-island trips in former times. Dr. Gill writes: "The *pai* is the ship of the old heathen days—a large double canoe, decked, with masts and sails."

The following note, by W. Bonar, appeared in volume 10 of the *Journal of the Polynesian Society:* "On the island of Mauke, of the Cook Group, there is, or was ten or twelve years ago, when I was trading there, a very old and large canoe made of *tamanu* wood. It must be nearly sixty feet long, or perhaps more; it is one of the old sea-going canoes. It is in three pieces, with butt joints for sewing together. The larger canoe—for it is double—ten years ago (1890) was in fine condition, but the smaller, or outrigger canoe, was nearly decayed. I was told that the then chief's father was nearly lost in her, and, on getting back to Mauke, caused the canoe to be hauled up, and she has remained there ever since. . . . I believe it to be about the last of the old sea-going canoes." The editor of the *Journal* adds: "This canoe is a *pahi*, or old sea-going canoe of the Cook Group, such as the extraordinary voyages were made in by the ancestors of the Rarotongans. The late Te Pou, of Rarotonga, told us this was the last of the old *pahi*."

A photograph of a fishing-canoe of Rarotonga shows the float to be connected with the canoe by means of two booms. One of these is straight and horizontal, and connected with the float by means of four or five short sticks lashed to the boom; the other is a curved pole attached directly to the float. The two Rarotongan canoes shown in figs. 146 and 147, at p. 204, however, show both booms pegged to the float.

When H.M. ship "Blonde" visited Mauke Isle early in the nineteenth century the commander saw some canoes of great length there: "Our path lay through a thick, shady wood, on the skirts of which, in a small open space, two handsome canoes were building. They were each eighty feet long, the lower part, as usual, of a single tree, hollowed out with great skill."

Of the canoes of Atiu we read in the account of Cook's third voyage: "About eight or ten canoes were here, all double ones—*i.e.*, two single ones fastened together, as is usual throughout the whole extent of the Pacific Ocean, by rafters lashed across. They were about twenty feet long, about four feet deep, and the sides rounded with a plank raised upon them, which was fastened strongly by means of withes. Two of these canoes were most curiously stained or painted all over with black in numberless small figures, as squares, triangles, &c., and excelled by far anything of that kind I had ever seen at any other island in this ocean. . . . The paddles were about four feet long, nearly elliptical, but broader at the upper end than the middle."

Williams, in his *Missionary Enterprises*, speaks of having seen at Atiu Isle, Cook Group, "a large double canoe . . . in the centre of which, on an elevated stage, was seated the principal chief." This was about the year 1823.

[*W. R. Reynolds, photo.*

FIG. 146.—SMALL OUTRIGGER CANOE OF RAROTONGA: AMA-TIATIA TYPE.

Indirect attachment of float.

[*W. R. Reynolds, photo.*

FIG. 147.—DIMINUTIVE OUTRIGGER OF RAROTONGA.

The following account of the double canoes of the Cook Group was received in 1913 from Major J. T. Large, late British Resident on that island :—

The Double Canoes (Vaka katea) *of the Cook Islands.* Atiu, Mauke, and Mitiaro (the two latter until recently belonging to the first-named by right of conquest) are the only islands in the group where the old-style large double canoes are still used, though now only for the nocturnal sport of scoop-netting flying-fish by torchlight. Formerly, before the advent of the European boat, these big double canoes were the ordinary means of transit from island to island, and carried crowds of warriors on their warlike expeditions, the canoes often returning to their own islands laden with the cooked bodies of the slain, and the wives and children of the latter as slaves for the conquerors. These canoes were fifty, sixty, and even as much as eighty feet long, made from the trunks of the *tamanu*, one of the largest, most durable, and suitable trees in these islands for the purpose. It required the full length of two trees to make an ordinary canoe, the bow length being called the *aumi* [*cf.* N.Z. *haumi*] and the stern length the *noko*. In the case of very big canoes it took three of the largest *tamanu* to form the canoe, the centre length being called the *puke*. The joinings (*pouanga*) are fitted with great nicety, as they have to be lashed together (*a'au*) with coconut-fibre (*ka'a*) laced through the holes (*putaka*), each turn being hove taut with a lever. The keel of the canoe is called the *takere*, and the inside the *riu*. In the hollowing-out of the latter, riblike projections are left at intervals to strengthen the canoe; these are called *vaitorea*. The broad board or slab (always in one piece) covering in the bow (*ei*) of the canoe is called the *utu-mua;* it follows the curve of the bow, and projects upwards to a point called the *raeutu*, twelve or eighteen inches high, according to the size of the canoe, while the bow itself ends in a point projecting downwards, called the *tara kokiri*. Small ornamental carvings on the upper side of the former are called *tapu*. In like manner part of the stern (*noko*) is covered in with a slab called the *utu-muri*, which follows the sharp curve upwards of the stern. On its upper part is a curious ornamental carving (*akatiki-tiki*) shaped like two human ears joined together. The signification of this symbol appears to have be enlost. The after end of the *utu-muri* is fastened to the *muri vaka*, a triangular-shaped piece of timber, four or five feet long, rising straight up from the point of the stern, to which its bottom end is lashed. The *muri vaka* of these canoes is identical with the New Zealand Maori *rapa* or *taurapa*, though it is not so elaborately carved and decorated—at least, not in these days.

Extending from the *utu-mua* to the *utu-muri* the topsides (*oa*) are lashed on. These island canoes, unlike the *waka* of New Zealand, owing to their narrow beam in proportion to their size, will turn over unless secured to an outrigger or another canoe. In the case of single canoes, a stout sapling, or long piece of timber, three or four feet away from the canoe, forms the outrigger (*ama*). Secured to this are the ends of two cross-pieces (*kiato*), which rest on the topsides at right angles to the canoe, and, being securely lashed thereto, keep the canoe steady. But with the double canoes I am describing the left-hand canoe is called the *ama*, while the right-hand one, which is always the larger and better one, is called the *katea*. The two, which are two and a half or three feet apart, are connected by three or more cross-pieces (*kiato*) very securely lashed to the canoes. These cross-pieces also form the joists for the centre staging (*ataata*) extending over the two canoes, on which most of the occupants of the canoe sit or stand. In their old war or voyaging canoes this staging was walled in as a protection from the weather, while a portion was raised and ornamented as a place for the chiefs: it was then called *ura*.

The mast (*tira*) was stepped in the fore part of the staging and guyed; the sail (*kie*) being of matting. The double canoes are also propelled with long oars (*oe*), the thole-pins being fixed in stout beams lashed on to the ends of the *kiato*. The steer-oar is called the *oe akatere* [N.Z. Maori *hoe whakatere*], and the bailer *tata*.

In catching flying-fish (*maroro*) with the scoop-net (*kupenga*), the handle of which is called *uata*, and the hoop extending the net *tutu*, made fast to the end of the *uata* and secured with a cross-piece (*tiare*), the fish are attracted to the side of the canoe by the glare of the torch (*rama*). The torch is made of leaves of the coconut-palm tied together. The man who holds the torch is called the *tangata turama;* he stands on the fore part of the *ataata*, while the one who takes the scoop-net, the most expert man of the party, called the *tangata taii*, stands in front of him with a foot on the *utu-mua* of each canoe. The quickness of sight and dexterity of some of these men in scooping in the fish is wonderful. But far more are caught at the limited spawning season in winter, though only during the three days of the month when the moon is in her first quarter. The flying-fish come up in shoals close to the edge of the reef to spawn. You will then see fifty or sixty of the small outriggers, one-man fishing-canoes, engaged in their capture. Quantities are cured for future use by being smoked on racks.

In the above description of the big double canoes of Atiu it will be seen that many of the parts and articles connected therewith are called by the same native names in these islands as those in use amongst the Maori of New Zealand, one of many links showing their common ancestry.

The above writer does not say that the oars used with a thole-pin represented a pre-European usage; presumably it is a modern one, borrowed from our boats.

Of the canoes of the Island of Mangaia we have a description that was also given by Major Large :—

When a piece of timber cannot be procured of sufficient length for a canoe, two or more pieces are joined; this join is called *poinga*, the foremost part of the hull being the *aumi* [*cf.* Maori *haumi*], and the aftermost part *miri vaka*. If it is found necessary to make the hull of more than two pieces, the part between any two joinings is called a *moe*. A small canoe hollowed out of a single log is called a *vaka tavatai*, but if composed of two or more pieces a canoe is called a *vaka poinga*. The top-strakes are called *oa*, the seats or thwarts are *no'oanga*.

The outrigger (*ama*) is connected with the hull by two cross-pieces (booms) called *kiato* and *tito*, the latter term being now obsolete. These *kiato* cross the hull, and, in large canoes, may project several feet on the opposite side. The left side of the canoe, next the outrigger, is called the *oa i ama ;* the right side of the canoe is *oa i katea*.

The flat piece of wood covering the bow and forming a figure-head is the *poki*. The point of the *poki*, just over the cutwater, is called *iu ariari*. Returning inwards along the *poki* there is a crescent-shaped piece of wood called the *uariri*. Close by this crescent is a star-shaped piece called the *maurua*. Between the *uariri* and the *maurua* is a connecting-piece called the *va' i karakia* (the place of divination). In the centre of the star is a hole, and into this hole fits a stylet of wood about fifteen inches long, connected with a cord which also passes through the hole, and is prevented

Fig. 148.—Small Outrigger Canoe of Mangaia.

from coming out altogether by a knot on the lower side of the *poki*. The stylet is called the *ui*. The canoe is steered by keeping it in line with the *ui* and some object at a distance. Half-way along the outrigger side of the canoe is a projecting ledge; through this are bored seven holes large enough to receive the *ui*, or stylet. The names of these holes are *te ra'iti* (the east), *ngaau* (south-east), *apatonga* (south), *rakiroa* (south-west), *opunga* (west), *akama* [*? akarua*] (north-west), and *apatokerau* (north). When the sky was overcast, or the heavenly bodies were obscured, by placing the *ui* in the proper hole the direction of the cord from the star to the hole would enable the canoe to be kept on her course in the required direction. All canoes in the seas of that part were said to have been provided with this apparatus.

At the stern is a lofty carved stern-post called *repe* (Maori *rapa*), the top of which is barbed in a peculiar fashion called *tara auini*. From the loops or holes in the stern-post hung loops of rope. From these short loops stout ropes could be fastened to the foremost outrigger [boom ?] (*kiato aumi*) on both sides. These were used in rough weather as life-lines. The lower life-line on the right side is called *iva*, that on the opposite side *iviroa*, the middle life-line on both sides *maoraora*, the uppermost lines *vaatiia*. There is a *pe* [*? pe'e-pehe*] or song to the effect that a good captain prepares his life-lines when he sees bad weather approaching.

As with the Maori, the sail was called *ra*. It was made either from the leaf of the pandanus (*rauara*), or from *pakoko*, a native cloth made from the bark of the *aoa* and *anga*. *Tata*, as in New Zealand, is the name of the canoe-bailer. The paddle is *oe*, the steering-paddle *oe tuoe ;* the mast is *tira* and the hole *riu*, as in New Zealand.

Illustrations are given of the carved and painted decorations of the canoe, the patterns being simple and mostly rectilinear; but, unfortunately, no illustration of the model canoe is given that might serve to explain the so-called steering-apparatus.* It is by no means made clear as to how a fixed apparatus on a moving body enabled voyagers to steer on a set course when no distant point to steer by was visible. Explanation is lacking as to this and some other points.

The following remarks concerning a Mangaian canoe are taken from the account of Cook's third voyage: "The fore part had a flat board fastened over it, and projecting out, to prevent the sea getting in on plunging, like the small canoes at Tahiti; but it had an upright stern, about five feet high, like some in New Zealand, and the upper end of this stern-post was forked. The lower part of the canoe was of white wood, but the upper was black, and their paddles, made of wood of the same colour, not above

Fig. 149.—Close View of Mangaia Canoe, showing Part of Steering-device.

three feet long, broad at one end, and blunted. They paddled either end of the canoe forward indifferently; and only turned about their faces to paddle the contrary way." The canoe seen was only about 10 ft. long.

Canoes of Niue, or Savage Island.

Forster says of the canoes of Niue (June, 1774): "They were very nearly of the same structure with those of Tonga-tapu, and had some carving, but were not so neatly wrought. They were single, and had strong outriggers."

The Niue folk term a ship *foulua*, or *tonga* (meaning "foreign"), but the former name was at one time applied to a canoe. These islanders have long ceased to make ocean-going vessels, their fishing-canoes being from 12 ft. to 25 ft. long, and about $1\frac{1}{2}$ ft. or 2 ft. deep. They are fitted with an outrigger, called *hama*. The natives state that their ancestors used sea-going double canoes, known as *vaka hai ua*.

* For illustrations mentioned see *Dominion Museum Bulletin No. 3*,

An account of the making of the Niue canoe, with the native names of all parts, its ornamentation, uses, &c., has been published in *Museum Bulletin No. 3.* It is the work of Te Rangi-hiroa, M.B., Ch.B., and is one of the best accounts of the making of a Polynesian canoe that has yet appeared. From it we learn that modern canoes of Niue are small fishing-craft, holding from one to four men. The top-strakes are called *oa*, the lashings of which do not appear on the outside. The top-strakes and some other parts may be adorned with simple designs, rectilinear, and resembling the *taniko* patterns seen on Maori cloaks. The outrigger (*hama*) is always on the left side of the hull, to which it is connected by two or more *kiato*, or booms. The inner ends of the booms are lashed to both top-strakes; their outer ends are connected with the outrigger by short thin pieces called *tutuki*, three or four in number, their lower ends being inserted in holes in the *hama* and lashed. In some cases an intermediate fore-and-aft rod is lashed to the booms as a longitudinal spar. Within the hull U-shaped pieces of wood may be lashed to the sides to give strength and support to the top-strakes. This is not a Maori feature, but is found in the western Pacific, and represents another step in the evolution of the plank-built boat as known to us. The first form of the modern boat-knee is seen in the Maori *tokai*, which merely supports the floor; while the Niue form is an improved one, imparting stability to the sides of the vessel—the true function of the boat-knee. Apparently this feature was carried eastward from the western Pacific. In the Manihiki canoe we shall encounter a more curious mode of bracing the topsides, in which the U-shaped piece is reversed and projects above the gunwales. The removable knees of the Niue canoe are termed *manu.*

In his *Journal of a Cruise among the Islands of the Western Pacific* Captain Erskine makes the following remarks on the canoes of Niue, as seen in 1849: "These first-comers were soon succeeded by ten or a dozen more canoes, each containing four persons, and all of similar construction, from twenty to twenty-four feet long, made apparently of a single tree with raised wash-streaks, the fore and after parts covered over and handsomely carved. An outrigger, composed of one long spar, floating in the water parallel to the canoe, and supported by three transverse ones, forming a platform, on which lay their spears and other implements, projected on one side, making it necessary for them, in this instance, to come on the weather side of the ship. This contrivance, common to most of the canoes of the Pacific, must not be confounded with that of a spar projecting to windward when under sail to enable a man to ballast the canoe with the weight of his body (although we afterwards saw that plan sometimes in operation among the Navigators Islands), but is one absolutely necessary to enable the narrow vessel to maintain its equilibrium in the smoothest water. Their paddles were short, concave in blade, and beautifully shaped like a plantain-leaf."

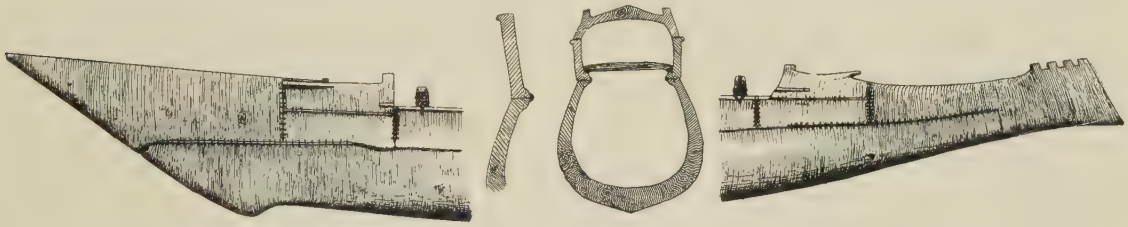
Canoes of Manihiki.

There is in the Dominion Museum a very good specimen of the Manihiki canoe, though, unfortunately, it lacks the outrigger. (See fig. 150.) Its length is 29 ft.; width in middle between top-strakes, 14½ in. In cross-section it much resembles that of a model of a Cinghalese outrigger in the Museum, the rounded inward-trending sides surmounted by the straight top-strakes. The sheer of the hull is, as in the Maori canoe, reduced by the form of the top-strakes, which are wider in the middle than at the two ends. Apart from the tumbling-in of the upper parts of the sides of the hull, the cross-section may be likened to that shown in *Maori Art*, which does not illustrate any known Maori form, but the narrow-beam, straight-sided outrigger canoe of the Pacific, except that thickness has been exaggerated.

The hull of this Manihiki canoe is in three pieces—that is to say, it has a *haumi* at each end. The central piece is about 10 ft. in length, and the two attached pieces

somewhat shorter. The joinings are butt joins, two square cut ends placed together and so lashed by passing cords through two series of holes bored near the two edges. The lashing-cords are flat, thin plaits that are drawn very tight, and contain and grip very thin narrow battens covering the vertical joins. These lashings are exposed, and not countersunk, as a Maori of New Zealand would fix them, though the thin flat cord is not prominent, but lies close to the timber-surface. The work is extremely neat and sightly, though the butt join is a method much inferior to the tongue-and-groove style employed by the Maori.

The upper parts of the hull-sides trend inwards; thus the widest part of the hold is below the level of the joining of hull and top-strake. At the join it is $11\frac{3}{4}$ in. wide, but $14\frac{1}{2}$ in. between the upper parts of the top-strakes. The hull is 12 in. in depth, and the top-strakes add another 8 in. to that depth—20 in. in all. The bottom of the hull is much rounded amidships, but sharpens toward both stern and stem. The top-strakes are 9 in. wide (*i.e.*, deep) in the middle, and decrease in width both ways to $6\frac{1}{2}$ in. at the ends, to which the prow and stern pieces are lashed, as in the canoes of New Zealand. Both top-strakes are composed of three pieces (which no Maori would approve of), which are butted together and lashed by means of passing cords through holes pierced near the edges, as in the case of the hull; but the mode of lashing is different, some strands being horizontal while others are crossed. The joins of the top-strakes do not, of course, coincide with those of the hull. The hull is made from a light-coloured timber, while the



[*Sketch by Miss E. Richardson.*

FIG. 150.—DIAGRAMS SHOWING PROW, STERN, AND CROSS-SECTION OF A MANIHIKI CANOE IN THE DOMINION MUSEUM. The cross-section shows interior lashings of the Fijian type.

top-strakes are of dark wood. The latter carries a cant or bead on its outer upper edge, as in the Maori canoe. The top-strake is 1 in. thick; the beading makes the top of it $1\frac{1}{4}$ in. thick. All joins of the hull and top-strake have very thin and narrow strips of some material used as battens to cover joints, being confined and tightly gripped by the lashings. The join of top-strake and hull resembles that of the Niue canoe described by Te Rangi-hiroa in *Bulletin No. 3*. The bottom of the top-strake has a cant on its inner side projecting 1 in., through which vertical holes are bored. Corresponding holes seem to have been bored through the inward-trending upper edges of the sides of the hull, through which the lashing-cords are passed. Some fibrous caulking-material has been used, and a slight covering batten placed over the joint, gripped by the lashings. Thus the lashing is on the inner side only, and does not appear on the outside of the canoe. This method is that of Fiji, Tonga, and other isles, but was unknown in New Zealand. The outer side of the bottom of the top-strake carries a flange that fits over the gunwale of the hull, projecting downwards, and, this flange being $\frac{1}{4}$ in. in thickness, the join on the outer side does not present a flush surface. The outer surfaces of the top-strakes are adorned with designs composed of inlaid pieces of pearl-shell. Two designs are employed, arranged alternately—one consisting of two vertical rows, each of five pieces of round cut shell; the other of a star-like design composed of a central round piece with four diamond-shaped pieces radiating from it. Across the top of the canoe, projecting upwards, are six braces of singular form, the ends of which rest on the upper surfaces of the

top-strakes, to which they are lashed in a neat and peculiar manner. Six cross-pieces $3\frac{1}{2}$ in. wide serve as seats, their ends resting on the cants or beadings on the bottom of the top-strakes; they are loosely tied in position. The narrowness of this craft is startling to those who know only New Zealand forms.

The prow, or head-piece, is in three parts, lashed to the hull and top-strakes. Its forward end is scarfed so that the widened extremity drops over the end of the hull. On its upper surface four square-cut knob-like projections, about $1\frac{1}{2}$ in. high, are arranged fore and aft, while at the rear end of the prow-piece are two more, set athwart. Just in front of the last is an elevation with a ridge-like top fore and aft. The object of these projections is unknown. The prow is adorned with inlaid pieces of shell—round, triangular, and diamond-shaped; also the name "Tauhunu" is thus inlaid on the right side of the prow, and the island name of "Manihiki" on the left side.

The stern-piece is also in three parts, and is produced to a point, with a flush base showing no scarf or shoulder. It carries two of the knob-like projections.

Colonel Fox speaks as follows of a peculiarity of the central Pacific area (Tonga, Samoa, Fiji, Bowditch Isle, &c.): "The ends of the canoe are covered with a deck extending over about one-third of its length fore and aft, and on this deck there is a row of upright pegs, carved out of the same piece as the deck, and running down the centre of it. Each peg is surmounted by a white *Cypraea ovula* shell tied on. The origin and meaning of this custom is unknown, but it was probably adopted originally as insignia of the rank of the owner. Its distribution is limited to a group of islands lying between about the 10th and 20th parallels of south latitude, and 170° and 180° west longitude. Cook, in 1773, speaks of it in the Friendly Isles; and Wilkes, in 1838, mentions it in Samoa, Fiji, and Bowditch Isle."

The late Maori chief known to us as Wi Marsh made a rude sketch of the "Arawa" canoe that brought his ancestors hither from Polynesia. This shows the prow of the canoe to be quite unlike the Maori forms known to us, and it has three vertical projections of considerable height on it, the object or use of which is not explained. (See fig. 157A.)

Canoes of the Austral Isles.

Ellis describes as follows the canoes of Tupuai, Austral Isles: "Their canoes, resembling those of Rapa, were generally sixteen or twenty feet long; the lower part being hollowed out of the trunk of a tree, and the sides, stern, and stem formed by pieces of thin plank sewed together with cinet, or cord, and adorned with shells. The stem projected nearly horizontally, but the stern, being considerably elevated, extended obliquely from the seat occupied by the steersman. The sterns were ornamented with rude carving, and, together with the sides, painted with a kind of red ochre, while the seams were covered with the feathers of aquatic birds."

Vancouver makes the following remarks on the canoes of Rapa, as seen by him in 1791: "We saw about thirty double and single canoes, though most of them were of the double sort: the single canoes were supported by an outrigger on one side, and all built much after the fashion of the Society Islands, without having their very high sterns, though the sterns of some of these were considerably elevated; and their bows were not without some little ornament. They were very neatly constructed, though the narrowest canoes I ever saw.. . . . The island did not appear to afford any large timber. . . . Some of the stoutest double canoes accommodated from twenty-five to thirty men."

In the Dominion Museum are six highly ornate ceremonial paddles from the Austral Isles. The paddles are entirely covered with fine carving resembling that of the Cook Isles. (See figs. 151, &c.) Similar specimens from the same group are figured in volume 1 of the University of Pennsylvania's *Museum Journal.*

[*H. Hamilton, photo.*

FIG. 151.—CARVED CEREMONIAL PADDLES OF HIGH ISLAND, AUSTRAL GROUP.

Canoes of Tongareva, or Penrhyn Island.

Of the canoes of this island, or congeries of small isles, Mr. S. P. Smith writes as follows: "They were of all sizes, the largest capable of holding forty or fifty men, and they invariably had an *ama*, or outrigger. They were made of a tree called *to;* not the *ito*, or ironwood, of the other islands, but a much softer wood. A tree from three to four feet in diameter was selected, and then patiently hacked down with shell adzes. The log is then rolled to the sea, where the action of the waves partially softens the wood,

[*H. Hamilton, photo.*

Fig. 151a.—Detail of Carving on High Island Paddles.

sufficiently so to allow the builders to split it up into variously-sized pieces, the longest and narrowest of which is selected to form a keel, about a foot broad, rounded at the bottom and hollowed inside. The keel is shaped so as to gradually slope up at either end, terminating above the water in the *iho*, or bow, at one end. Various pieces of irregular shape are now cut to fit one another, and with them the sides are built up, each piece being carefully rounded off so as to conform to the general

contour. They are polished with coral to make them fit, and the edges of each piece are bored with a sharp stone or shell to receive the lashings which hold them together. The joints are cemented together with a preparation of pounded coconut husk steeped in water. The body of the canoe is not built the whole length of the keel-piece, but projecting parts are left both at stern and bow, the latter to act as a cutwater, which, being bluff, prevents the vessel sinking in the trough of the seas. The upper tier of pieces has a projecting ledge on which the paddlers sit, whilst in the stern is a raised seat used to steer from. The paddle is long, the blade narrow and usually carved." It is not made clear how a fore-and-aft ledge accommodates paddlers: possibly cross-pieces used as seats rest on the ledges, as in the Manihiki canoes.

[*H. Hamilton, photo.*

FIG. 151B.—DETAIL OF CARVING ON HIGH ISLAND PADDLE.

Quiros gives us little satisfaction as to Polynesian canoes. Sailing westward from the Paumotus, he came to an island that he places in 18° 30′ S. latitude, and remarks as follows on the vessels seen there: "Their canoes were built of a white wood; their form long and narrow. The planks were fastened together at the jointing of the seams with strong cords made from the palm-tree; the sails were of the latine shape, and made of matwork of palm-leaves."

In his account of Gente Hermosa (Rakahanga) Isle, Torres says: "The natives had large sailing-canoes, which they kept under sheds."

The canoes seen by Hale at Duke of York Island, in the Union Group, were double, and the paddle-blades were not oval, but oblong and slender.

Canoes of the Ellice Group.

Funafuti, in the Ellice Group, formerly possessed seagoing canoes, and remains of such vessels have been seen on Fakaafu. Mr. Hedley, quoting Lister, gives the following account of Fakaafu canoes in *Memoirs of the Australian Museum*, III, Part 4: "The canoes of the present time are built just like those of Samoa, having a single outrigger. Owing to the scarcity of large trees on the island the body of the canoe is built of several pieces, each separately hollowed, and these are laced together with sinnet. Often there are as many as four distinct pieces along the bottom, and the sides are built up with additional

[*H. Hamilton, photo.*

FIG. 151c.—DETAIL OF CARVING ON HIGH ISLAND PADDLE.

pieces to the required height. Each piece is accurately shaped so that it will fit in among the neighbouring ones, and the joints are caulked with resin. The bow and stern are covered in for a short distance, and on their upper surfaces a number of small pyramidal projections are left in the middle line, to which white shells of *Cypraea ovula* are attached for ornament. The upper surface of the stern-piece is not horizontal, but slopes obliquely downwards to the end. The canoes hold seven or eight people."

These canoes are propelled by sail and paddle. Mr. Hedley remarks that "The sail was formerly of palm or pandanus mats. It is hoisted after the ordinary Polynesian

method, upon two converging masts, stepped upon the thwarts or gunwale and steadied by a backstay. At each tack the masts and sail are unshipped, and carried round bodily end for end; the craft therefore never goes about. Under sail they can travel seven or eight miles an hour easily; they lie close to the wind, but for want of a keel make rapid leeway. . . . The paddlers sit on the thwarts, paddling chiefly on the starboard side, as the outrigger impedes them on the port. . . . The paddle . . . is plunged vertically into the water, and withdrawn after a short fore-and-aft stroke. A course is kept by all without any particular steering. To turn sharply, the paddle is struck into the water by the aftermost man, as far away as he can reach, and pulled through the water towards him. When in sufficiently shoal water the paddle is always exchanged for the pole, a method of progression which is likewise preferred by the Papuans. For an anchor, a block of coral is made fast to the painter. These canoes draw about six inches, and weight about a hundredweight and a half. . . . A worn-out canoe cuts up into handy troughs or coffins."

One of these canoes measured by Mr. Hedley was 23½ ft. in length, 1¼ ft. in greatest breadth, and 1 ft. 5 in. in greatest depth. Another was 29 ft. long, 1⅓ ft. wide, and 1 1/12 ft. deep, with 20 ft. of open hull space, and outrigger float 12 ft. long and 4 ft. distant from the canoe-hull. The hull was very thin, hewed down to about ¾ in. in thickness. The lashings were from 4 in. to 10 in. apart, and self-contained, the cord not carried on to the next pair of holes. The three outrigger booms were 3 ft. apart and extended across the hull, serving as thwarts. Each boom is a small trunk with part of a branch left on, and the end of this downward-trending branch base was lashed between two pegs driven into the float. In many groups the boom is a straight pole connected with the float by means of longer pegs fixed in the latter. The float is a round, straight log about 6 in. in diameter and pointed at both ends. "In use," says the above-mentioned writer, "it swims awash; when the canoe is heeled gradually over, a capsize occurs the instant the float is lifted clear of the water." In the Funafuti canoe three or more longitudinal spars on the booms form a platform for carrying gear on, but it is never occupied by persons.

Of the canoes of the Tokelau (or Union) Group we have the briefest of accounts in volume 1 of the *Journal of the Polynesian Society:* "Their canoes are of the outrigger type, the same as seen in Fiji. They are built up of very thin coconut slabs, cut down by the axe or adze and sewn together. Sometimes they are dugouts made of drift timber."

The natives of this group, however, constructed large seagoing craft in former times, and made voyages to the Samoan, Tongan, and Fijian Groups.

Canoes of Easter Island.

Roggewein (1722) speaks of a canoe of Easter Island as being "a small canoe made of small pieces of plank curiously and neatly patched together."

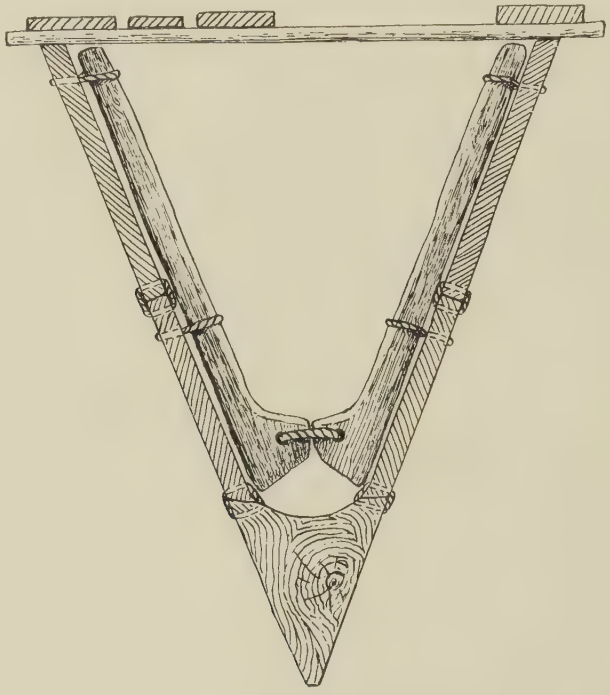
Of a canoe seen at Easter Island in 1774 Forster writes: "Their canoe was another curiosity, being patched up of many pieces, each of which was not more than four or five inches wide, and two or three feet long. Its length might be about ten or twelve feet, its head and stern were raised considerably, but its middle was very low. It had an outrigger, or balancer, made of three slender poles, and each of the men had a paddle, of which the blade was likewise composed of several pieces."

La Perouse remarked that Easter Island canoes resembled in form those of the Society Isles, but were smaller: "They are composed only of very narrow planks, four or five feet long, and at most can carry but four men."

In Dr. Philippi's work on Easter Island the following short account is given of the canoes of that lone isle, as seen in 1870: "Existing boats are only from eighteen to twenty feet in length, with the bow and stern slightly carved or scratched with figures. They are very narrow, and would not serve for long voyages. The pieces of wood of which they are

formed are some of them two or three feet long by four or five inches wide, fastened together with sinnet."

The account of Easter Island by W. J. Thomson, of the United States Navy, published in the *Report of the National Museum* for 1889, contains a few notes on canoes. The writer remarks that the canoes of this island were few in number and small in size, on account of the scarcity of material to be found on the island. "Many of the early navigators refer to the scarcity of boats (canoes) belonging to the natives. Captain Cook saw several canoes ten or twelve feet long, built of pieces four of five inches wide and not more than two or three feet long, but the majority of his native visitors swam off to his ship. Captain Beechey saw three canoes on the beach. Von Kotzebue saw three canoes, each containing two men. At the time of our visit the only boats on the island were two large ones belonging to Messrs. Salmon and Brander, built of material obtained from the wrecks on the coast. There are no canoes in use at the present time,



[*Sketch by Miss E. Richardson.*

FIG. 152.—CROSS-SECTION OF MODEL OF CANOE OF GILBERT GROUP, SHOWING SMALL HULL PIECE, LASHINGS OF MAORI FORM, AND ATTACHED KNEES TO BRACE THE STRAKES.

An interesting illustration of the development of the built-up ribbed boat. The straight sides are remarkable. These model canoes are not made to scale, however, and are often unreliable in form. Specimen in Dominion Museum.

but we found two very old ones in a cave on the west coast, having long ago passed their days of usefulness on the water, and now serving as burial-cases. They were a patchwork of several kinds of wood sewed together, and, though in an advanced stage of dry-rot, were sufficiently well preserved to prove that it never grew on Easter Island, but had been obtained from the driftwood on the beach."

The above paper has illustrations of two forms of paddles, one being a very rude implement made in two pieces, the short blade being lashed to the handle, while the other is a double-bladed paddle of much better make, in one piece, and with one blade ornamented. Possibly the latter end was not used in paddling, or maybe it was a ceremonial object, which it certainly resembles.

Canoes of Society Isles (Tahiti, &c.).

In view of the fact that many of the Polynesian folk who settled in New Zealand in past times came from the Society Group, it will be interesting to note the style of vessels used by the natives of those isles at the time when European voyagers first visited their shores. It is possible that the double canoes of the Maori seen by Tasman resembled those of Tahiti described by Cook and others, though the built-up sides of the Tahitian canoe gave place here to the dugout with one top-strake, owing to the abundance of large-sized trees obtainable in New Zealand forests.

We have, unfortunately, no information in Maori tradition as to the form of canoe used by the Mouriuri folk of the isles. They may or may not have resembled Tahitian forms. The only canoe of an abnormal or non-Maori type known to us is that already described as having been found buried in a lagoon-bed in the South Island.

When Wallis approached Tahiti in June, 1767, his vessel was soon surrounded by "some hundreds of canoes." When the natives delivered an attack on his vessel, there were, he remarks, "not less than three hundred about the ship, having on board at least two thousand men; many thousands of men were also upon the shore, and more canoes coming from every quarter." After the unpleasantness was over, a landing-party destroyed "more than fifty canoes, many of which were sixty feet long and three broad, and lashed together."

Wallis gives the following account of the Tahitian canoes:—

The boats or canoes of these people are of three different sorts. Some are made out of a single tree, and carry from two to six men: these are used chiefly for fishing. Some were constructed of planks, very dexterously sewed together; these were of different sizes, and would carry from ten to forty men. Two of them were generally lashed together, and two masts set up between them. If they were single they had an outrigger on one side, and only one mast in the middle. With these vessels they sail far beyond the sight of land, probably to other islands. . . . A third sort seemed to be intended principally for pleasure and show: they are very large, but have no sail, and in shape resemble the gondolas of Venice. The middle is covered with a large awning, and some of the people sit upon it, some under it. . . . We saw, three or four times a week, a procession of eight or ten of these vessels passing at a distance, with streamers flying, and a great number of small canoes attending them. . . .

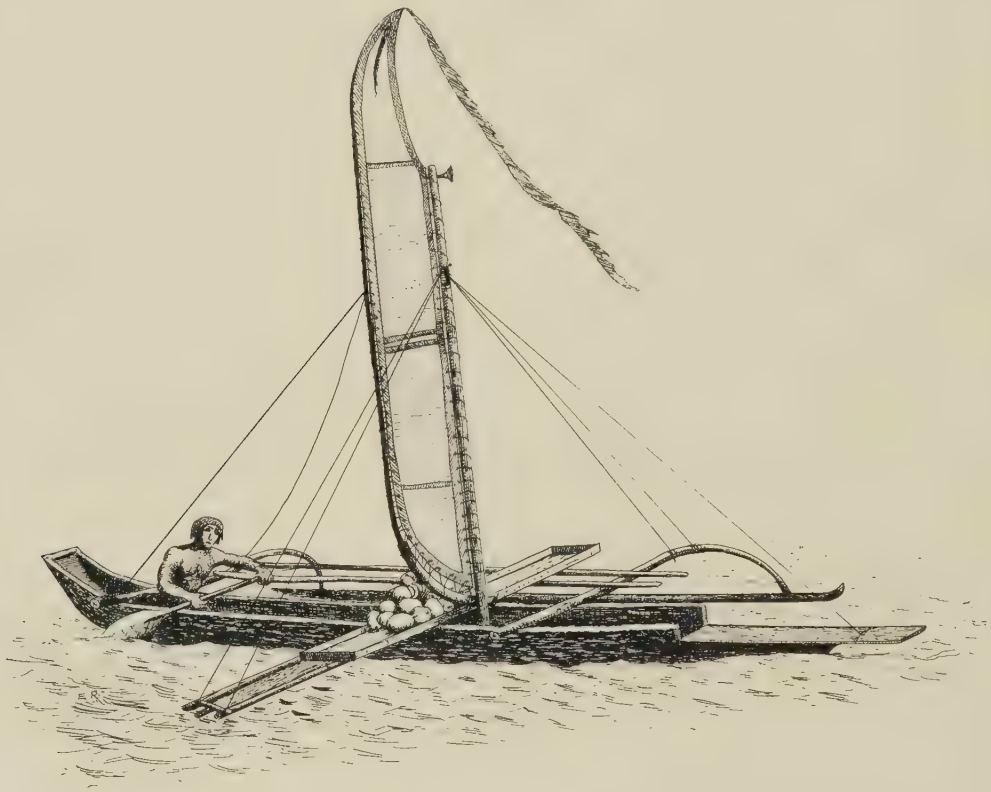
The plank of which these vessels are constructed is made by splitting a tree with the grain into as many thin pieces as they can. They first fell the tree with a kind of hatchet, or adze, made of a tough greenish kind of stone, very dexterously fitted into a handle. It is then cut into such lengths as are required for the plank, one end of which is heated till it begins to crack, and then with wedges of hardwood they split it down. Some of these planks are two feet broad and from fifteen to twenty feet long. The sides are smoothed with adzes of the same materials and construction, but of a smaller size. Six or eight men are sometimes at work upon the same plank together, and, as their tools presently lose their edge, every man has by him a coconut shell filled with water, and a flat stone, with which he sharpens his adze almost every minute. These planks are generally brought to the thickness of about an inch, and are afterwards fitted to the boat with the same exactness that would be expected from an expert joiner. To fasten these planks together, holes are bored with a piece of bone that is fixed into a stick for that purpose—a use to which our nails were afterwards applied with great advantage—and through these holes a kind of plaited cordage is passed, so as to hold the planks strongly together. The seams are caulked with dried rushes, and the whole outside of the vessel is payed with a gummy juice which some of the trees produce in great plenty, and which is a very good succedaneum for pitch.

The wood which they use for their large canoes is that of the apple-tree, which grows very tall and straight. Several of them that we measured were near eight feet in the girth, and from twenty to forty to the branches. . . . The small canoes are nothing more than the hollowed trunk of the breadfruit-tree.

The above remarks describing how logs were split into planks are interesting. The heat of a fire kept burning near the end of a green log would certainly cause it to shrink and crack, thus affording an entrance for thin entering-wedges, which, on being driven home, would enable thicker bursting-wedges to be used.

Of the canoes of Tahiti, seen in 1769, Cook says:—

Their canoes, or proes [*proa*], are built all of them very narrow, and some of the largest are sixty or seventy feet long. These consist of several pieces; the bottom is round, and made of large logs hollowed out to the thickness of about three inches, and may consist of three or four pieces; the sides are of plank of nearly the same thickness, and are nearly perpendicular, rounding in a little towards the gunwale. The pieces of which they are built are well fitted, and fastened or sewed together with strong plaiting something in the same manner as old china, wooden bowls, &c., are mended. The greatest breadth is at the after part, which is generally about eighteen or twenty inches, and the fore part about one-third narrower; the height from the bottom to the gunwale seldom exceeds two and a half or three feet. They build them with high curved sterns which are generally ornamented with carved work; the head or fore part curves little or nothing. The smaller canoes are built after the same plan, some out of one, two, or more trees, according to their size, or the use they are for. In order to prevent them from oversetting when in the water, all those that go single, both great and small, have what is called outriggers, which are pieces of wood



[*Sketch by Miss E. Richardson.*

Fig. 153.—Outrigger Canoe of Tahiti, showing the Characteristic Flat Projecting Piece at Prow, and Peculiar Form of Sail.

From *Cook's Voyages.*

fastened to the gunwale and project out on one side about six, eight, or ten feet, according to the size of the boat. (See fig. 153.) At the end is fastened, in a parallel direction to the canoe, a long log of wood simply; or some have it shaped in the form of a small boat, but this is not common; this lays in the water and balances the boat. Those that are for sailing have outriggers only on the other side abreast of the mast; these serve to fasten the shrouds to, and are of use in trimming the boat when it blows fresh; the sailing-proes have some one and some two masts. The sails are of matting, and are made narrow at the head and square at the foot, something like a shoulder-of-mutton sail. . . .

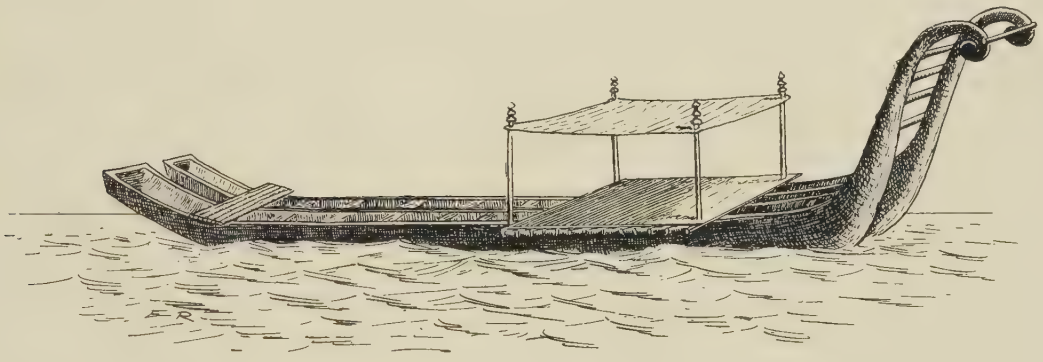
I have mentioned above that the single canoes have outriggers, for those that go double—that is, two together—which is very common, have no need of any; and it is done in this manner: Two

canoes are placed in a parallel direction to each other, about three or four feet asunder, securing them together by small logs of wood laid across and lashed to each of their gunwales; thus the one boat supports the other, and are not in the least danger of upsetting; and I believe it is in this manner that all their large proes are used, some of which will carry a great number of men, by means of a platform made of bamboo or other light wood and the whole length of the proes and considerably broader; but I never saw but one fitted in this manner upon the whole island. Upon the fore part of all these large double proes was placed an oblong platform about ten or twelve feet in length, and six or eight in breadth, and supported about four feet above the gunwale by stout carved pillars. The use of these platforms, as we were told, are for the club-men to stand and fight upon in time of battle; for the large canoes, from what I learn, are built most, if not wholly, for war, and their method of fighting is to grapple one another, and fight it out with clubs, spears, and stones. I never saw but one of *these sort* of canoes in the water; the rest were all hauled ashore, and seemed to be going to decay; neither were there very many of them upon the island.

The chiefs and better sort of people generally go from one part of the island to another in small double canoes which carry a little movable house; this not only screens them from the sun by day, but serves them to sleep in at night. . . . (See fig. 154.)

They have some few other canoes, pahees [*pahi*] as they call them, which differ from those above described, but of these I saw but six upon the whole island, and was told they were not built here.

The two largest were each seventy-six feet long, and when they had been in use had been fastened together. These are built sharp and narrow at both ends and broad in the middle; the bottom is likewise sharp, inclining to a wedge, yet bulges out very much and rounds in again very quick just below the gunwale. They are built of several pieces of thick plank and put together as



[*Sketch by Miss E. Richardson.*

FIG. 154.—DOUBLE CANOE OF TAHITI.

From *Cook's Voyages.*

the others are, only these have timbers in the inside, which the others have not. They have high curved sterns; the head also curves a little; and both are ornamented with the image of a man carved in wood, very little inferior to work of the like kind done by common ship-carvers in England. . . .

Their proes [*proa*], or canoes, large and small, are rowed and steered with paddles, and, notwithstanding the large ones appear to be very unwieldy, they manage them very dexterously, and I believe perform long and distant voyages in them, otherwise they could not have the knowledge of the islands in these seas they seem to have. They wear for show or ornament at the masthead of most of their sailing-canoes pendants made of feathers. . . .

In these proes, or pahees [*pahi*], as they call them, from all the accounts we can learn, these people sail in those seas from island to island for several hundred leagues, the sun serving them for a compass by day, and the moon and stars by night. When this comes to be proved we shall be no longer at a loss to know how the islands lying in those seas came to be peopled, for if the inhabitants of Ulietea have been at islands lying two hundred or three hundred leagues to the westward of them it cannot be doubted but that the inhabitants of those western islands may have been at others as far to westward of them, and so we may trace them from island to island quite to the East Indies.

The *pahi* mentioned were deep-sea vessels obtained from the Paumotu natives. The island called "Ulietea" by Cook is Ra'iatea, the "Rangiatea" of Maori tradition.

When at Tahiti in 1774, Cook speaks of seeing upwards of three hundred canoes ranged in order for some distance along the shore, all completely equipped and manned: "The vessels-of-war consisted of an hundred and sixty large double canoes, very well equipped, manned, and armed . . . the vessels were decorated with flags, streamers, &c. . . . the vessels were ranged close alongside of each other, with their heads ashore and their stern to the sea, the admiral's vessel being nearly in the centre. Besides the vessels-of-war, there were an hundred and seventy sail of smaller double canoes, all with a little house upon them, and rigged with mast and sail, which the war-canoes had not. These, we judged, were designed for transports, &c., for in the war-canoes was no sort of provisions whatever. In these three hundred and thirty vessels I guessed there were no less than 7,760 men . . . but I am not sure that they had their full complement of men or rowers—I rather think not."

It was noted by Forster in 1773 that, while the Society Isles were well furnished with timber from their forests, the Friendly Isles were but poorly provided with timber; also, in the former group canoes were very much more numerous. He mentions that he saw one hundred canoes surrounding Cook's vessel at Tahiti. Also he informs us that canoe-sails were composed of several mats "sowed" together, and had streamers of feathers attached to them.

Of the sails of Tahitian canoes Mr. Stokes has written: "The sail of the Society-Islander was in the shape of a half-moon. A sprit or boom was fastened to the mast near the foot, and curved upwards to a height of a third more than that of the mast, which was vertical, the upper end of the sprit being directly over the masthead. The sail thus being enclosed in a case, and practically a fixture when set, was awkward to work, and when a squall came it was necessary to keep the head of the vessel to the wind. . . . The only means of reefing was to unloose the sprit at foot and roll the sail around it. . . . Many of these canoes had two sails."

The illustration of a Tahitian double canoe given in Hawkesworth's *Voyages* shows two canoes of equal size with horizontally projecting boards at the prow and curved high sterns hollowed as though part of the hull. A narrow platform across the two hulls projects out on both sides. The sail is of singular form, seemingly straight on one side and curved on the other.

Cook speaks of having seen at Tahiti, in 1769, "many large double canoes, built and ornamented uniformly."

In Banks's journal we find these items concerning the canoes of Raiatea, Society Isles: "The inhabitants were at work making and repairing the large canoes called by them *pahi*, at which business they worked with incredible cleverness, although their tools were as bad as possible. I will give the description and dimensions of one of their boats. . . . Her extreme length from stem to stern, not reckoning the bending-up of both those parts, 51 ft.; breadth in the clear at the top, forward 14 in., amidships 18, aft 15; in the bilge, forward 32 in. amidships 35, aft 33; depth amidships, 3 ft. 4 in.; height above ground, 3 ft. 6 in.; her head raised, without the figure, 11 in.; her stern, 8 ft. 9 in.; the figure, 2 ft. Alongside of her was lashed another like her in all respects, but smaller in proportion, being only 33 ft. in her extreme length . . . some of them are much larger than the one described above. . . . With these boats they venture themselves out of sight of land; we saw several of them at Tahiti which had come from Ulietea [Raiatea]; and Tupia [Tupaea] has told us that they undertake voyages of twenty days. They keep the boats very carefully under boat-houses. . . . We saw a double *pahi* such as that described, but much longer. She had upon her an awning supported by pillars, which held the floor at least 4 ft. above the deck or upper surface of the boats."

The construction of these vessels, as described by Banks, was peculiar. Instead of being a hull hewn out of a log, and with top boards attached, the above-described canoe consisted

of a keel, to which were secured side boards, to which again were secured planks of a bulging form, and on these the top pieces were fastened.

"These *pahi*, Banks tells us, were the vessels used for deep-sea voyaging, whereas the *va'a* [*waka*] used for fishing and inshore work was of a square form and flat-bottomed.

The *pahi* above described, being so narrow, were fit only to be used as double canoes in deep-water work. They were used merely for fighting and deep-sea voyages. "Those of a middling size are said to be best, and the least liable to accident in stormy weather. In these, if we may credit the reports of the inhabitants, they make very long voyages, often remaining several months from home, visiting in that time many different islands, of which they reported to us the names of nearly a hundred. They cannot, however, remain at sea above a fortnight or twenty days, although they live as sparingly as possible, for want of proper provisions and place to store them in, as well as water, of which they carry a tolerable stock in bamboos."

Banks also noted that all the canoes of the Society Group were so narrow that, to render them safe vehicles, they had to be furnished with an outrigger, or formed into double canoes. He considered the former much less safe than the latter, as he saw outrigger canoes overturned "very often." These vessels leaked so that one person was employed almost constantly in throwing out the water. This was probably owing to the two seams, which, it appears, were not caulked, but wedged in some manner; whereas in the New Zealand vessel there was but the one horizontal seam on either side.

"When sailing, they have either one or two masts fitted to a frame which is above the canoe: they are made of a single stick; in one that I measured of thirty-two feet in length the mast was twenty-five feet high, which seems to be about the common proportion. To this is fastened a sail about one-third longer, but narrow and of a triangular shape, pointed at the top, and the outside curved; it is bordered all round with a frame of wood, and has no contrivance either for reefing or furling, so that in case of bad weather it must be entirely cut away. The material of which it is made is universally matting. With these sails their canoes go at a very good rate, and lie very near the wind, probably on account of their sail being bordered with wood, which makes them stand better than any bowlines could possibly do. On the top of this sail they carry an ornament which, in taste, resembles much our pennants. It is made of feathers, and reaches down to the very water, so that when blown out by the wind it makes no inconsiderable show. They are fond of ornaments in all parts of their boats; in the good ones they commonly have a figure at the stern, and in the *pahi* they have a figure at both ends, and the smaller *va'a* [*waka*] have usually a small carved pillar upon the stern.

"The *pahi* are built in a most ingenious manner. Like the others [*waka*], they are laid upon a long keel, which, however, is not more than four or five inches deep. Upon this they raise two ranges of planks, each of which is about eighteen inches high, and about four or five feet in length; such a number of pieces must necessarily be framed and fitted together before they are sewed; and this they do very dexterously, supporting the keel by ropes made fast to the top of the house under which they work, and each plank by a stanchion; so that the canoe is completely put together before any one part is fastened to the next, and in this manner it is supported till the sewing is completed. This, however, soon rots in the salt water; it must be renewed once a year at least; in doing so the canoe is entirely taken to pieces and every plank examined. By this means they are always in good repair; the best of them are, however, very leaky, for as they use no caulking the water must run in at every hole made by the sewing.

"For the convenience of keeping these *pahi* dry, we saw in the islands where they are used a peculiar sort of house built for their reception and put to no other use. It was built of poles stuck upright in the ground and tied together at the top, so that they make a kind of Gothic arch; the sides of these are completely covered with thatch down to the ground, but the ends are left open. One of these I measured was fifty paces in length, ten in breadth, and twenty-four feet in height, and this was of an average size."

Of the ordinary type of canoe of Tahiti, the *va'a*, the above writer says: "These serve for fishing and for short trips at sea, but do not seem at all calculated for long voyages, whereas the *pahi* are rather too clumsy for fishing. The *va'a* differ very much in length: I have measured them from ten feet to seventy-two feet, but by no means proportional in breadth, for while that of ten feet was about one foot in breadth, that of seventy-two feet was scarce two feet, nor is their height increased in much greater proportion. They may be subdivided into three sorts, the fighting *va'a* [*waka*], the common sailing or fishing *va'a*, and the travelling *va'a*. The fighting *va'a* is by far the longest; the head and stern of these are considerably raised above the body in a semicircular form, seventeen or eighteen feet in height, when the centre is scarcely three feet. These boats never go to sea singly; two are always fastened together side by side at the distance of about two feet by strong poles of wood extending across both, and upon them is built a stage in the fore part about ten or twelve feet long and a little broader than the two boats: this is supported by pillars about six feet high, and upon it stand the people who fight with slings, spears, &c.

"The sailing and fishing *va'a* vary in size from about forty feet in length to the smallest I have mentioned, but those which are under twenty-five feet in length seldom or never carry sail: their sterns only are raised, and those not above four or five feet: their prows are quite flat, and have a flat board projecting forwards about four feet beyond them.

"Those which I have called travelling *va'a* differ from these in nothing except that two are constantly joined together in the same manner as the war-boats, and that they

[*Sketch by Miss E. Richardson.*

FIG. 155.—SMALL OUTRIGGER CANOE OF TAHITI, SHOWING MAORI FORM OF LASHING STRAKES AND DIRECT ATTACHMENT OF FLOAT.

From Wilkes's *Narrative of the United States Exploring Expedition.*

have a small neat house five or six feet broad by seven or eight feet long fastened upon the fore part of them, in which the principal people sit while they are carried from place to place. . . . All *va'a* agree in the sides built like walls and the bottoms flat. In this they differ from the *pahi*, of which the sides bulge out and the bottom is sharp, answering, in some measure, instead of a keel. . . . Of the *va'a* the foundation is always the trunks of one or more trees hollowed out: the ends of these are sloped off, and sewed together with the fibres of the husk of the coconut; the sides are then raised with planks sewed together in the same manner. . . .

"In their longer voyages they steer in the day by the sun, and in the night by the stars: of these they know a very large number by name, and the cleverest among them will tell in what part of the heavens they are to be seen in any month when they are above the horizon. They know also the time of their annual appearance and disappearance to a great nicety. . . . The people excel much in predicting the weather . . . foretelling the quarter of the heavens from whence the wind will blow by observing the Milky Way."

Forster writes as follows of a fleet of canoes seen at Tahiti in April, 1774, during Cook's second voyage:—

We then walked down along the whole range of vessels, whose prows were turned to the shore. All our former ideas of the power and affluence of this island were so greatly surpassed by this magnificent scene that we were perfectly lost in admiration. We counted no less than one hundred

and fifty-nine great double war-canoes, from fifty to ninety feet long betwixt stem and stern. When we consider the imperfect tools which these people are possessed of, we can never sufficiently admire the patience and labour with which they have cut down huge trees, dubbed the plank, made them perfectly smooth, and at last brought these unwieldy vessels to the great degree of perfection in which we saw them. A hatchet, or, properly, an adze, of stone, a chisel, and a piece of coral are their tools, to which they only add the rought skin of a ray, when they smooth or polish their timber. All these canoes are double—that is, two joined together, side by side, by fifteen or eighteen strong transverse timbers, which sometimes project a great way beyond both the hulls, being from twelve to twenty-four feet in length, and about three feet and a half asunder. When they are so long they make a platform fifty, sixty, or seventy feet in length. On the outside of each canoe there are, in that case, two or three longitudinal spars, and between the two connected canoes one spar is fixed to the transverse beams. The heads and sterns were raised several feet out of the water, particularly the latter, which stood up like long beaks, sometimes near twenty feet high, and were cut into various shapes. A white piece of cloth was commonly fixed between the two beaks of each double canoe, in lieu of an ensign, and the wind swelled it out like a sail. Some had likewise a striped cloth, with various red chequers, which, as we afterwards learned, were the marks of the divisions under the different commanders. At the head there was a tall pillar of carved work, on the top of which stood the figure of a man, or rather of an urchin, whose face was commonly shaded by a board like a bonnet, and sometimes painted red with ochre. These pillars were generally covered with bunches of black feathers, and long streamers of feathers hung from them. The gunwale of the canoes was commonly two or three feet above the water, but not always formed in the same manner; for some had flat bottoms, and sides nearly perpendicular upon them, whilst others were bow-sided, with a sharp keel, like the section drawn in Captain Cook's first voyage (see Hawkesworth, vol. 2, p. 225). A fighting-stage was erected towards the head of the boat, and rested on pillars from four to six feet high, generally ornamented with carving. This stage extended beyond the whole breadth of the double canoe, and was from twenty to twenty-four feet long, and about eight or ten feet wide. The rowers sat in the canoe, or under the fighting-stage on the platform, which consisted of the transverse beams and longitudinal spars; so that wherever these crossed there was room for one man in the compartment. Those which had eighteen beams, and three longitudinal spars on each side, besides one longitudinal spar between the two canoes, had consequently no less than a hundred and forty-four rowers, besides eight men to steer them, four of whom were placed in each stern. This, however, was not the case with the greatest part of the canoes here assembled, which had no projecting platform, and where the rowers or paddlers sat in the hulls of the canoes. The warriors were stationed on the fighting-stage to the number of fifteen or twenty. . . . Besides the vessels of war . . . we counted seventy smaller canoes . . . most of which were double likewise, with a roof on the stern.

This writer speaks of a striking sight he saw when forty-four large war-canoes passed one by one through a reef-opening, then deployed into line abreast, and advanced with remarkable regularity: "On the middlemost canoe there was a man placed behind the fighting-stage, who gave signals with a green branch to the rowers, either to paddle to the right or left. The movement in consequence of his command was in perfect tune, and so very regular that it seemed as if all the paddles were parts of the same machine, which moved some hundred arms at once." He also speaks of the "innumerable canoes" seen at the Island of Raiatea. The fact of paddlers being stationed on the capacious platform reminds one of P. H. Newman's theory as to the method of propulsion adopted in the case of the triremes, quatriremes, &c., of old Roman times.

In speaking of the double canoes of Tahiti, Ellis says:—

In fine weather and with a fair wind they are tolerably safe and comfortable; but when the weather is rough and the wind contrary they are miserable sea-boats, and are tossed about completely at the mercy of the winds. . . . In long voyages single canoes are considered safer than double ones, as the latter are sometimes broken asunder, and are then unmanageable; but, even though the former should fill or upset at sea, as the wood is specifically lighter than the water, there is no fear of their sinking. When a canoe is upset, or fills, the natives on board jump into the sea, and, all taking hold of one end, which they press down, so as to elevate the other end above the sea, a great part of the water runs out; they then suddenly loose their hold of the canoe, which falls upon the water, emptied in some degree of its contents. Swimming along by the side of it, they bale out the rest, and, climbing into it, pursue their voyage. . . . The single canoes, though safer at sea, are yet liable to accident, notwithstanding the outrigger, which requires to be fixed with care, to prevent them from upsetting. . . . The natives of the eastern isles frequently come down to the Society Islands

in large double canoes, which the Tahitians dignify with the name of *pahi*, the term for a ship. They are built with much smaller pieces of wood than those employed in the structure of the Tahitian canoes, as the low coralline islands produce but very small kinds of timber; yet they are much superior both for strength, convenience, and sustaining a tempest at sea. They are always double, and one canoe has a permanent covered residence for the crew. The two masts are also stationary, and a kind of ladder, or wooden shroud, extends from the sides to the head of the mast. The sails are large, and made with fine matting. . . . One canoe, that brought a chief from Rurutu, upwards of three hundred miles, was very large. It was somewhat in the shape of a crescent, the stern and stem high and pointed, and the sides broad; the depth from the upper edge of the middle to the keel was not less than twelve feet. It was built with thick planks of the *Barringtonia*, some of which were four feet wide; they were sewn together with twisted or braided coconut husk. Their naval reviews often exhibited a spectacle which to them was remarkably imposing. Ninety or a hundred canoes were, on these occasions, ranged in a line along the beach, ready to be launched in a moment. Their elevated and often curiously carved stems; their unwieldly bulk; the raised and guarded platform for the fighting-men; the motley group assembled there, bearing their singularly shaped weapons, their cumbrous dress and broad turbans; the lofty sterns of their vessels, grotesque and rudely carved, together with the broad streamers floating in the breeze, combined to inspire them with the most elevated ideas of their naval prowess. The effect thus produced was heightened by the appearance of the sacred canoes, bearing the images or the emblems of the gods, the flag of the gods, and the officiating or attending priests. Often, while the vessels were thus ranged along the beach, the king stood in a small one, drawn by a number of his men, who walked in the sea. In front of each canoe he paused, and addressed a short harangue to the warriors, and an *upu* [Maori *kupu*], or invocation, to the gods. After this was ended, at a signal given, the whole fleet was in a moment launched upon the ocean, and pulled with rapidity and dexterity to a considerable distance from the shore, where the several varieties of their naval tactics were exhibited; after which they returned in regular order, with precision, to the shore. . . . When Captain Cook was there in 1774 he supposed the fleet to consist of not fewer than one hundred and seventy canoes, each carrying forty men; making altogether six thousand fighting-men."

Ellis tells us that naval fights were not uncommon among the Society-Islanders, and that when such affairs took place in the calm waters of a lagoon the canoes of each fleet were sometimes lashed together in a line, to prevent any breaking of their line or retreat from the action. He also writes of ninety war-canoes, each about one hundred feet long, being employed in a war between the natives of Huahine and those of Raiatea.

The same writer remarks that the building, fitting, and managing of canoes was, at Tahiti, one of the most general and important of their avocations:—

It also procures no small respect and endowment for the *tahu'a tarai va'a* [*tohunga tarai waka* (canoe-hewing experts) in Maori].

The canoes of the Society-Islanders are various, both in size and shape, and are double or single. Those belonging to the principal chiefs, and the public district canoes, were fifty, sixty, or nearly seventy feet long, and each about two feet wide, and three or four feet deep; the sterns remarkably high, sometimes fifteen or eighteen feet above the water, and frequently ornamented with rudely carved hollow cylinders, square pieces, or grotesque figures called *ti'i* [Maori *tiki*]. . . . Next in size to these was the *pahi*, or war-canoe. I never saw but one of these: the stern was low, and covered so as to afford a shelter from the stones and darts of the assailants. The bottom was round, the upper part of the sides narrower, and perpendicular; a rude imitation of the human head, or some other grotesque figure, was carved on the stern of each canoe. The stem, often elevated and carved like the neck of a swan, terminated in the carved figure of a bird's head, and the whole was more solid and compact than the other vessels. In some of their canoes, and in the *pahi* among the rest, a rude sort of grating, made of the light but tough wood of the breadfruit-tree, covered the hull of the vessels, the intervening space between them, and projected a foot or eighteen inches over the outer edges. On this the rowers usually sat, and here the mariners who attended to the sails took their stations. . . . There was also a kind of platform in the front, or generally near the centre, on which the fighting-men were stationed. These canoes were sometimes sixty feet long, between three and four feet deep, and, with their platform in front or in the centre, were capable of holding fifty fighting-men. (Footnote: In *Cook's Voyages* a description is given of some one hundred and eight feet long.)

The *va'a ti'i* [*waka tiki*], or sacred canoe, was always strong and large, more highly ornamented with carving and feathers than any of the others. Small houses were erected in each, and the image of the god, sometimes in the shape of a large bird, at other times resembling a hollow cylinder,

ornamented with various-coloured feathers, was kept in these houses. Here their prayers were preferred and their sacrifices offered.

Their war-canoes were strong, well built, and highly ornamented. They formerly possessed large and magnificent fleets of these, and other large canoes; and at their general public meetings or festivals no small portion of the entertainment was derived from the regattas, or naval reviews, in which the whole fleet, ornamented with carved images, and decorated with flags and streamers of various-coloured cloth, went through their various tactics with great precision. . . . The *va'a ti'i*, or sacred canoes, formed part of every fleet, and were generally the most imposing in appearance and attractive in their decorations. . . .

Every large canoe had a distinct name, always arbitrary, but frequently descriptive or some real or imaginary excellence in the canoe, or in memory of some event connected with it. Neither the names of any of their gods or chiefs were ever given to their vessels: such an act . . . would have been deemed the greatest insult that could have been offered. . . .

The most general and useful kind of canoe is the common double canoe, usually from twenty to thirty feet long, strong and capacious, with a projection from the stem, and a low shield-shaped stern. . . . One of these in which we voyaged . . . was between thirty and forty feet in length, strong and well built. The keel was formed with a number of pieces of tough *tamanu* wood, twelve or sixteen inches broad and two inches thick, hollowed on the inside and rounded without, so as to form a convex angle along the bottom of the canoe; these were fastened together by lacings of tough elastic cord made with the fibres of the coconut husk. On the front end of the keel, a solid piece, cut out of the trunk of a tree, so contrived as to constitute the fore part of the canoe, was fixed with the same lashing, and on the upper part of it a thick board or plank projected horizontally in a line parallel with the surface of the water. This front piece, usually five or six feet long, and twelve or eighteen inches wide, was called the *ihu va'a* [*ihu waka*] (nose of the canoe), and, without any joining, comprised the stem, bows, and bowsprit of the vessel.

The sides of the canoe were composed of two lines of short plank, an inch and a half or two inches thick. The lower line was convex on the outside, and nine or twelve inches broad; the upper one straight. The stern was considerably elevated, the keel was inclined upwards, and the lower part of the stern was pointed, while the upper part was flat, and nine or ten feet above the level of the sides. The whole was fastened together with cinet, not continued along the seams, but by two, or at most three holes made in each board, within an inch of each other, and corresponding holes made in the opposite piece, and the lacing passed through from one to the other. A space of nine inches or a foot was left, and then a similar set of holes made. The joints or seams were not grooved together, but the edge of one simply laid on that of the other and fitted with remarkable exactness by the adze of the workman, guided only by his eye: they never used line or rule. The edges of their planks were usually covered with a kind of pitch or gum from the breadfruit-tree, and a thin layer of coconut husk spread between them. The husk of the coconut swelling when in contact with water fills any apertures that may exist. . . . The two canoes were fastened together by strong curved pieces of wood placed horizontally across the upper edges of the canoes, to which they were fixed by strong lashings of thick coir cordage.

The space between the two bowsprits, or broad planks projecting from the front of our canoe, was covered with boards, and furnished a platform of considerable extent; over this a kind of temporary awning of plaited coconut leaves was spread, and under it the passengers sat during the voyage. The upper part of each of the canoes was not above twelve or fifteen inches wide; little projections were formed on the inner part of the sides, on which small movable thwarts or seats were fixed, whereon the men sat who wrought with the paddle. . . . The steersman stands or sits in the stern, with a large paddle: the rowers sit in each canoe two or three feet apart . . . the steersman gives the signal to start by striking his paddle violently against the side of the canoe. . . .

They have also a remarkably neat double canoe called *maihi*, or twins, each of which is made out of a single tree, and both are exactly alike. . . .

The single canoes are built in the same manner and with the same materials as the double one. Their usual name is *tipai-hoe*. . . . The small *puhoe* . . . is generally a trunk of a tree, seldom more than twenty feet in length, rounded on the outside, and hollow within; sometimes sharp at both ends, though generally only at the stem. . . .

The *va'a motu* [*waka motu* in Maori], or island canoe, is generally a large, strong, single vessel, built for sailing, and principally used in distant voyages. In addition to the ordinary edge, or gunwale, of the canoe, planks twelve or fifteen inches wide are fastened along their sides, after the manner of washboards in a European boat. The same are also added to double canoes when employed on long voyages. A single canoe is never used without an outrigger, varying in size with the vessel. It is formed with a light spar. This *ama* [outrigger] is always placed on the left side, and fastened to the canoe by two horizontal poles, from five to eight feet long; the front one is straight and firm, the other curved and elastic. It is so fixed that the canoe, when empty, does not float upright, being

inclined rather to the left, but when sunk in the water, on being laden, it is generally erect, while the outrigger, which is firmly and ingeniously fastened to the sides by repeated bands of cinet, floats on the surface. In addition to this, the island canoes have a strong plank, twelve or fourteen feet long, fastened horizontally across the centre in an inclined position, one end attached to the outrigger, and the other extending five or six feet over the opposite side, and perhaps elevated four or five feet above the sea. A small railing of rods is fastened along the sides of this plank, and it is designed to assist the navigators in balancing the keel, as a native takes his station on the one side or the other, to counteract the inclination which the wind or sea might give to the vessel.

In navigating their double canoes the natives frequently use two sails, but in their single vessels only one. The masts are movable, and are only raised when the sails are used. They are slightly fixed upon a step placed across the canoe, and fastened by strong ropes or braces extending to both sides, and to the stem and stern. The sails were made with the leaves of the pandanus split into thin strips, neatly woven into a kind of matting. The shape of the sails of the island canoes [*waka motu*, or long-voyage canoe] is singular. The side attached to the mast is straight, the outer part resembling the section of an oval, cut in the longest direction.

The other sails are commonly used in the same manner as sprit or lugger sails are used in European boats. The ropes from the corners of the sails are not usually fastened, but held in the hands of the natives. . . . The paddles of the Tahitians are plain, having a smooth round handle, and an oblong-shaped blade.

Their canoes, having no rudder, are steered by a man in the stern, with a paddle generally longer than the rest. In long voyages they have two or three steering-paddles, including a very large one, which they employ in stormy weather to prevent the vessel from drifting to leeward.

The *tataa*, or scoop, with which they bale out the leakage, is generally a neat and convenient article, cut out of a solid piece of wood.

Their canoes were formerly ornamented with streamers of various-coloured cloths, and tufts of fringe and tassels of feathers were attached to the masts and sails. . . . A small kind of house or awning was erected in the centre, or attached to the stern, to screen the passengers from the sun by day and the damp by night. . . . They do not appear to have ornamented the body or hull of their vessels with carving or painting.

In building their vessels, all the parts were first accurately fitted to each other, the whole was taken to pieces, and the outside of each plank smoothed by rubbing it with a piece of coral and sand moistened with water; it was then dried and polished with fine dry coral. . . . It is only those who have been regularly trained to the work that can build a large canoe, and in this there is a considerable division of labour—some laying down the keel and building the hull, some making and fixing the sails, and others fastening the outriggers, or adding the ornaments. The principal chiefs usually kept canoe-builders attached to their establishments. . . . The trees that are cut down in the mountains, or the interior of the islands, are often hollowed out there, sometimes by burning, but generally by adze, or cut into the shape designed, and then brought down to the shore. . . . The priest had certain ceremonies to perform, and numerous and costly offerings were made to the gods of the chief, and of the craft or profession, when the keel was laid, when the canoe was finished, and when it was launched. Valuable canoes were often among the national offerings presented to the gods, and afterwards sacred to the service of the idol.

In the above account we note that the side planks of the Tahitian canoes were lashed in the same style that is seen in the Maori canoe, except that the lashings were arranged in groups. The raised rim lashing of the western islands had not been introduced.

We have to thank Missionary Ellis for the above details concerning Tahitian vessels, and for much other matter descriptive of native customs. It is much to be regretted that more of our New Zealand missionaries did not take an equally intelligent interest in their surroundings; we have no such data concerning Maori vessels. The descriptions of these Tahitian craft are interesting on account of the fact that our Maori folk of New Zealand came from that region, and because we have so scant a knowledge of the double canoe and outrigger canoe formerly used by our natives. They were probably derived from eastern Polynesian forms, and resembled them in their fittings.

Forster is apparently the only writer who mentions having seen a single canoe used without an outrigger at Tahiti, and that may have been an unusual occurrence.

Ellis mentions some curious prophecies said to have been uttered by certain natives of the Society Group prior to the arrival of European ships in those seas. He says:

"Among the native prophets of former times there appear to have been several of the name of Maui. One of the most celebrated of this name resided at Raiatea, and on one occasion, when supposed to be under the inspiration of the god, he predicted that in future ages a *va'a ama 'ore* [Maori, *waka ama kore*], literally an 'outriggerless canoe' would arrive at the islands from some foreign land. Accustomed to attach that appendage to their single canoes, whatever might be their size or quality, they considered an outrigger essential to their remaining upright on the water. . . . The absence of this has ever appeared to the South-Sea-Islanders as one of the greatest wonders connected with the visits of the first European vessels. . . . The chiefs and others to whom Maui delivered his prophecy were also convinced in their own minds that a canoe would not swim without this necessary balance. . . . He persisted in his predictions, and, in order to remove his scepticism as to its practicability, launched his *umete* [Maori *kumete*], or oval wooden dish, upon the surface of a pool of water, and declared that in the same manner would the vessel swim that should arrive."

This oral tradition was preserved until the arrival of Wallis's and Cook's vessels, when the natives declared that the prediction of Maui was accomplished and the outriggerless vessels had arrived. Hence, in Ellis's time, when European ships or boats were seen, they were often greeted with the cry, "*Te va'a a Maui, e! Te va'a ama 'ore*" ("O! the canoe of Maui, the outriggerless canoe!").

Ellis also wrote that another of Maui's predictions was that after the outriggerless vessel arrived there would appear a *va'a taura 'ore*, a vessel without ropes or cordage. This prophecy the natives could not understand, but Ellis thought it probable that, should a steamer ever reach the islands, it might be accepted by the natives as the "ropeless vessel." This second edition of Ellis's work was published in 1831.

An illustration of a small outrigger canoe of Tahiti shows the forward boom as straight and connected with the float by means of three short sticks. The after boom is a crooked stick, the end of which is connected directly with the float.

An illustration in Seurat's *Tahiti* shows a lateen sail with two yards on a canoe of Mangareva.

Canoes of the Paumotu Group.

It has already been noted that the natives of the above group constructed large double deep-sea vessels. These *pahi* carried permanent masts fitted with shrouds and ratlines, as opposed to the sail with attached spars that was raised bodily when required and lowered when not required, such as were employed at New Zealand, the Society Group, and elsewhere.

A double canoe encountered at sea, out of sight of land, west of the Paumotu Group, by the voyagers Le Maire and Schouten, in 1616, was described as follows: "The vessel navigated by these islanders was formed of two large and handsome canoes, which were placed parallel and at a convenient distance (the *Navigation Australe* says, a fathom and a half) from each other. In the middle of each canoe a very broad, thick plank of a red-coloured wood, and very light, was placed lengthways upon its edge; across the two planks were laid some small beams, and upon the beams a platform of thin planks. The whole was compact and well fastened together. Over one part of the platform was a small shed of matting, under which the women and children remained. There was but one mast and one sail. The mast was fixed in a step towards the fore part of the starboard canoe; the sail was of triangular form, and attached to a yard which rested on the upper end of the mast, which was forked for the purpose. The vessel was steered with oars abaft. The sail was of matting, and towards the upper part of it there was marked a figure representing a cock. . . . Their cordage was well made. They were provided with hooks for fishing, the back part of which were of stone, and the hook or bearded part of bone, tortoise-shell, or mother-of-pearl. Everything appertaining to the vessel was neat and well fitted for sea."

The sail described above was apparently the true lateen sail.

Of two canoes examined at King George's Isles, in the Paumotu Group, in 1765, Commodore Byron wrote: "One of them was thirty-two feet long, and the other somewhat less, but they were both of a very curious construction, and must have cost those who made them infinite labour. They consisted of planks exceedingly well wrought, and in many places adorned with carving; these planks were sewed together, and over every seam there was a strip of tortoise-shell, very artificially fastened, to keep out the water. Their bottoms were as sharp as a wedge, and they were very narrow, and therefore two of them were joined laterally together by a couple of strong spars, so that there was a space of about six or eight feet between them. A mast was hoisted in each of them, and the sail was spread between the masts. The sail, which I preserved, and which is now in my possession, is made of matting, and is as neat a piece of work as ever I saw. Their paddles were very curious, and their cordage was as good and as well laid as any in England, though it appeared to be made of the outer covering of the coconut. When these vessels sail, several men sit upon the spars which hold the canoes together."

He also mentions having seen at the same group "two or three very large vessels, one of which had two masts, and some cordage aloft to support them."

The strip of tortoise-shell used to cover joints takes the place of the wooden battens of the Maori canoe, and is probably the material covering joints of the Manihiki canoe already described. At a little distance it looks like a piece of thin iron hoop.

In the account of Wallis's voyage (1767) are given some notes on the Paumotu canoes. At one place were seen "seven large canoes, with two stout masts in each. . . . The canoes appeared to be about thirty feet long, four feet broad, and three-and-a-half feet deep. Two of these, being brought alongside of each other, were fastened together, at the distance of about three feet asunder, by cross-beams passing from the larboard gunwale of one to the starboard gunwale of the other, in the middle and near to each end."

Later, in landing on the island, these voyagers "saw several tools made of shells and stones, sharpened and fitted into handles, like adzes, chisels, and awls. They saw several canoes building, which are formed of planks, sewed together, and fastened to several small timbers that pass transversely along the bottom and up the sides."

The "small timbers" referred to would appear to be genuine ribs, though the canoe-makers had not advanced so far as to secure the planks to the ribs only; they were lashed to each other, thus the ribs were merely a secondary support. This practice is interesting as showing an advance on the Maori canoe, in which the *tokai* was a form of pseudo-rib that did not support the side planks in any way. It is interesting to note in various parts of the Pacific certain steps in the evolution of the built-up frame boat from the primitive dugout canoe.

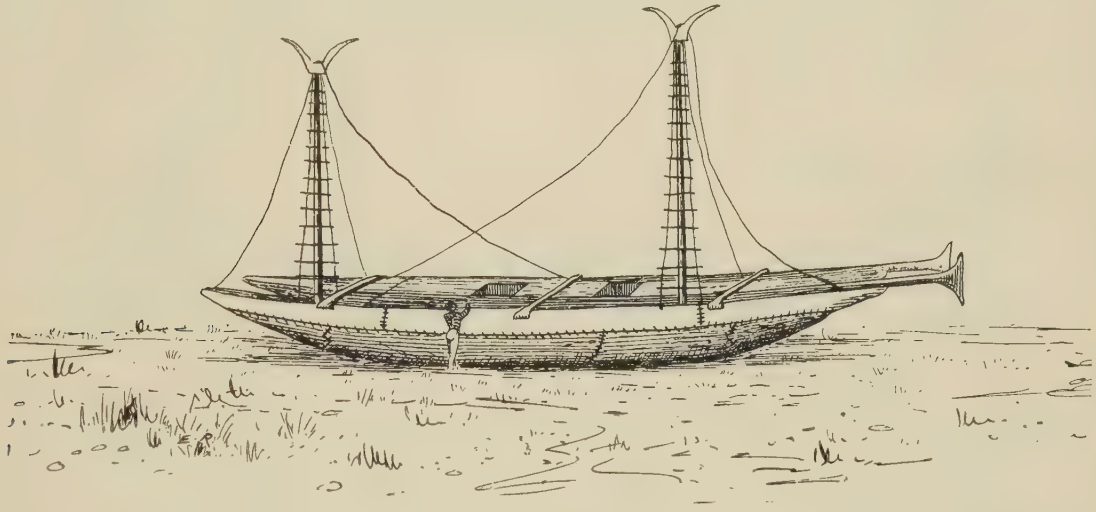
Of some small canoes seen at an island of the Paumotu Group in 1774 Forster wrote: "The canoes . . . were very short, but stout, and pointed at both ends, and had a sharp keel."

Of the natives of the Paumotu Group Ellis says: "They formerly built better vessels than any other nation in the eastern part of the ocean, and they are more daring and successful navigators than the more favoured and civilized tribes which they occasionally visit. Their canoes were dignified by the Tahitians with the name of *pahi*, a term applied only to their own war-canoes and the vessels of foreigners, and they are still superior to any in this part of the Pacific."

In his *Memorandum on the South Sea Islands* Mr. H. B. Sterndale tells us that on some isles of the Paumotu Group are (or were) seen the remains of groves of gigantic *tamanu* trees. "I say 'remains' for the reason that this wood has from all time been in great request for the construction of canoes, and consequently was accounted very valuable. It seems incredible how in times past, before the introduction of iron tools

into this region, the savages contrived to work it, as in hardness it is equal to mahogany; and the sight of the enormous stumps which remain in many places bears striking testimony to the patient ingenuity of the barbarian artificers who, with axes of stone, were able to cut down and hew into shape so intensely hard a material."

The following account of two double canoes seen at Raraka Isle is taken from Commander Wilkes's work on the United States Exploring Expedition, which reached the group in 1839: "They are thirty-five feet long and four-and-a-half feet wide, connected together by a strong framework, on which is placed a deck and a temporary hut is erected on their voyages. (See fig. 156.) Every part is neatly put together, and well secured with twine and sennit made of coconut fibres; no iron or metal of any kind is used in their construction; they have two masts, supported by vines in place of ropes, and are enabled to spread large mat sails; they steer with a large oar." A sketch given shows the visible hull to be composed of four pieces, the ends seemingly not square-cut but in form like a >, one fitted into a slot of corresponding form in the other piece. Sketches, however, are often far from being reliable. The top-strake is a wide one, in three pieces—widest in the middle, as usual. There are three stays to each of the



[*Sketch by Miss E. Richardson.*

FIG. 156.—DOUBLE CANOE OF PAUMOTU GROUP, SHOWING MASTS AND SHROUDS.

From Commodore Wilkes's *Narrative of the United States Exploring Expedition.*

two masts; also, each has shrouds and attached ratlines or wood rungs extending from the hull to the tops. Each mast-top is furnished with a widely branched fork.

Another sketch given is that of a small longshore single canoe seen at the Island of Waituhi. It has an outrigger attached by two curved booms to the hull. Of these canoes Wilkes writes: "The canoes were quite small, being only from twelve to fifteen feet long. They generally contained two and sometimes three natives. Each canoe had an outrigger, and a projecting point, both before and behind, by which they get into them from the water. They are formed of strips of coconut wood sewed together. Two persons can carry them. Their paddles were curved backwards."

Canoes of Marquesas Group.

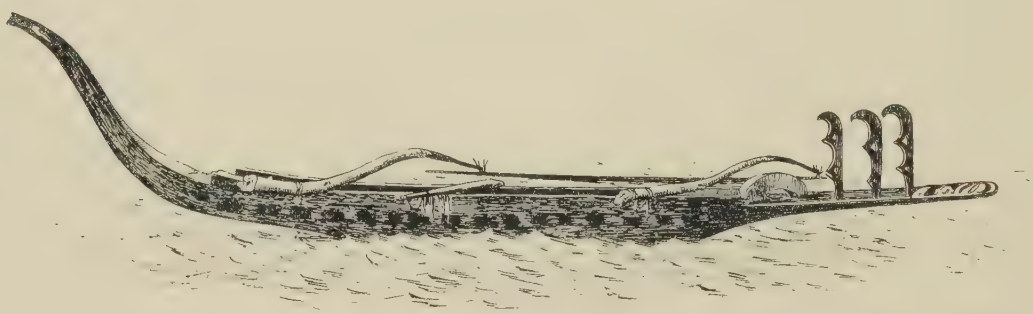
In the account of Mendana's voyage is the following brief note on canoes of the Marquesas, as seen in 1595: "The natives of the Marquesas had large sailing-canoes neatly constructed: a single tree formed the keel, prow, and stern, to which the planks

were strongly fastened, and likewise to each other, with cords made from the coconut rind. One of the canoes had between thirty and forty rowers. The tools with which the natives wrought were made of shells and the bones of fishes."

When Mendana's vessels neared the coast of Magdalena Island, of the above group, about seventy canoes put off to inspect the ships. These canoes contained from three to ten persons each.

Forster makes few remarks on the canoes of the Marquesas. Of fifteen seen near the ship he writes: "Some were double, and contained fifteen men; others, on the contrary, were small, and had from three to seven men. . . . Their canoes were thin, and formed of boards slightly sewed together, and their paddles were made like those of Tahiti, with a knob at the end." Again, he writes: "Their canoes were likewise very similar to those of Tahiti, but of no great size. The heads [prows] had commonly some flat upright piece, on which the human face was coarsely carved; and their sails were made of mats, triangular, and very broad at the top. The paddles which they used were made of a heavy hard wood, short, but sharp-pointed, and with a knob at the upper end."

Anent the canoes of the Marquesas, Porter, the American voyager, wrote early in last century: "These vessels are generally about forty feet in length, thirteen inches wide, and eighteen inches deep. They are formed of many pieces of the breadfruit-tree, cut



[*Sketch by Miss E. Richardson.*

FIG. 157.—OUTRIGGER CANOE OF MARQUESAS GROUP, SHOWING TAHITIAN FORMS OF PROW AND STERN, TOGETHER WITH THREE SINGULAR PROJECTIONS ON THE PROW.

From *Cook's Voyages.*

into the form of planks, and sewed together with the fibres of the outside shell of the coconut. The seams are covered inside and out with strips of bamboo, sewed to the edge of each plank, to keep in a stuffing of oakum. . . . The keel consists of one piece, which runs the whole length, is hollowed out in the form of a canoe, and seems to stiffen the whole vessel and keep it straight. Three pieces of thin plank, placed in the manner of partitions, divide the interior into four parts, and perform the office of timbers to keep the vessel from separating or closing together. Outriggers from the bow, middle, and stern, with a long piece of light wood secured to the extremity of each, keep them from upsetting, which, from their narrowness, would frequently happen were it not for this contrivance. The ornamental part consists of a flat prow, which projects about two feet, and is rudely carved on the upper surface to represent the head of some animal. Sometimes there is attached to it a small board, supported by a rudely carved figure of a man. From the stern is a slender projection of six or eight feet in length, and in the form of a sleigh runner. Their paddles are very neatly made of a hard black wood, highly polished. Their handles are slender, the blades of an oval form, broadest toward the lower part, and terminating in a point like a hawk's bill. They were all without sails, and did not appear to be managed with much skill or dexterity.

At some of the coves I observed the frames of boats of a different construction set up, shorter and wider than the canoes, and in shape somewhat similar to the common whaleboat; but I saw no such vessel in use among those who visited the ship."

This was at Adams Island, or Rooahooga [?], as Porter terms it; while, in writing of Madison's Island, or Nukuhiva, he remarks: "The war-canoes of this island differ not much from those already described. . . . They are larger, more splendid, and highly ornamented, but the construction is the same. They are about fifty feet in length, two feet in width, and of a proportionate depth; they are formed of many pieces. . . . These canoes are owned only among the wealthy and respectable families, and are rarely used but for the purposes of war, or for pleasure, or when the chief persons of one tribe make a visit to another. In such cases they are richly ornamented with locks of human hair intermixed with bunches of gray beard, strung from the stem projection to the place raised for the steersman. . . . The chief is seated on an elevation in the middle of the canoe, and a person fancifully dressed in the bow, which has the additional ornaments of pearl-shells strung on coconut branches raised in the fore part of the canoe. She is worked altogether by paddles, and those who use them are placed two on a seat. . . . They are not, however, so fleet as might be expected, as our whaleboats could beat them with great ease."

[*Sketch by Miss E. Richardson.*

FIG. 157A.—SKETCH OF THE "ARAWA" CANOE IN THE MARSH MAORI MS. IN AUCKLAND LIBRARY.

(See p. 280.)

An interesting form of prow that reminds us of the Marquesas canoe depicted in *Cook's Voyages*. Near the projecting horizontal piece at the prow are written the words "*te tohu*," meaning "the sign."

Apparently these were either inferior canoes or inferior paddlers. A whaleboat would stand a poor chance of beating "with great ease" a good canoe well paddled.

Porter continues: "Their fishing-canoes are vessels of a larger and fuller construction, many of them being six feet in width, and of an equal depth. They are managed with paddles more resembling an oar, and are, in some measure, used as such, but in a perpendicular position, the fulcrum resting on the outriggers projecting from each side. . . . The canoes used for the purpose of navigating from one island to another—a navigation very common—are similar in their construction to the larger kind of fishing-canoes, and are called 'double' canoes, and are furnished with a triangular sail made of a mat, similar to that generally called a 'shoulder-of-mutton' sail, but placed in an inverted position, the hypothenuse forming the foot of the sail, to which is secured a boom. These are also worked during a calm with paddles, and appear capable of resisting the sea for a long time. The canoes formed for the sole purpose of going in search of new lands are of a still larger construction, and are rigged in the same manner. They use also occasionally a kind of catamaran, which they construct in a few minutes, and a kind of surf-board similar to that of the natives of the Sandwich Islands."

The pieces termed "partitions" seem to have had the bracing effect of knees or ribs, though differing in form, and illustrate another step in the evolution of the built-up frame boat. It would be of interest to ascertain what evidence there is in the Pacific as to any change, if any, from carvel-built to clinker-built frame boats. The use of paddles as oars is, unfortunately, not clearly described, nor is there any assurance that it was a pre-European usage, though presumably it was so. This practice, reported from the Marquesas, Atiu, and the Chatham Isles, calls for some inquiry. A similar report from the west coast of the South Island of New Zealand has not been corroborated by any reliable evidence.

The Marquesas canoe-sail depicted in *Cook's Voyages* is of the same form as that used by the Maori, and rigged in the same manner, with mast and boom or sprit.

Canoes of Hawaiian Isles.

Here again both forms of the Polynesian canoe were employed—the double canoe, and the single canoe furnished with an outrigger. Dr. Samwell, Surgeon of the "Discovery" during Cook's third voyage, wrote as follows: "Of canoes they have two sorts, the single

[*Sketch by Miss E. Richardson.*

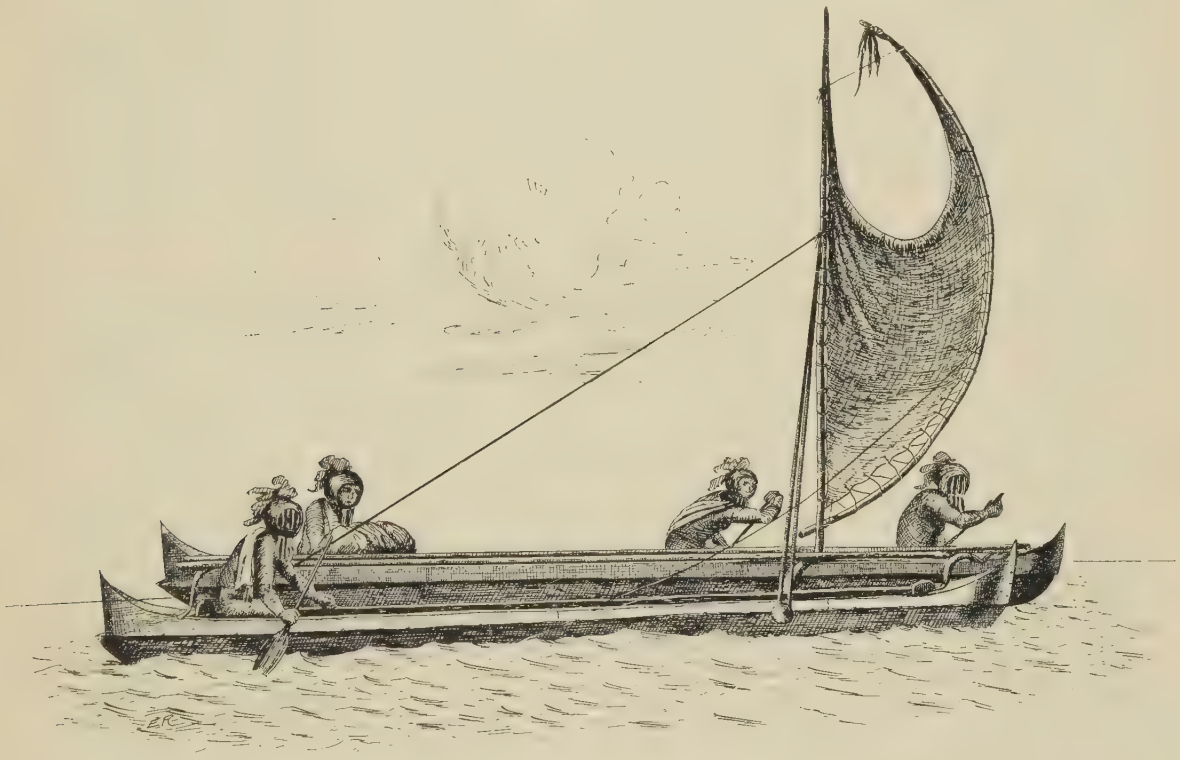
FIG. 157B.—DRAWING OF A NEW ZEALAND WAR-CANOE MADE BY TUI, WHO WAS IN ENGLAND IN 1818.

and the double. They are made exactly alike, but those that form the double canoe are much larger than any single one, which in general are from five to seven or eight yards long, and will hold from four to ten people. The bottom of the canoe is made out of one piece of wood hollowed, which they often dye black. On this they rise the sides with thin white boards, which they bring together about two feet from the head and stern, where they end in a point turned up a little. They have outriggers on the larboard side. They are made of three pieces of wood, one large, which serves to balance the canoe, and two bent and fastened to the canoe. The paddles are broad, and made of light wood, in the shape of a spade. The double canoe consists of two large ones joined together by cross-pieces of wood, forming an arch between them, on which a platform is erected, where the chiefs generally sit, and where they carry their hogs and other articles of trade. On one of these cross-pieces, near the middle of the canoe, the mast rests, and is secured by shrouds and stays. One end of the yard rests against the foot of the mast, and, taking a sweep, forms an arch of a circle, the upper end of which is as high as the masthead. The sail is made of strong matting sewed together, and is joined to the mast and the

yard, and at the upper end forms a half-moon, which gives their canoes, when under sail, a very singular appearance. They generally have a bunch of black feathers at the mast-head, and at the end of the yard a kind of pendant flying, made of cloth. In the stern of their canoes they carry small wooden images, which they call *etee* [Maori, *he tiki*—an image]. Some of the double canoes are twenty yards long . . . and the largest will hold . . . about sixty or seventy men."

Like most travellers' accounts, the above gives us some idea of the general appearance of the canoes of the Hawaiian or Sandwich Isles, but furnishes little detail as to their construction—a very common fault.

Ledyard, who was in the "Resolution" when Cook was slain by the Hawaiians, says of the assembly of natives, "They had assembled from the interior and the coast. Three thousand canoes were counted in the bay, filled with men, women and children, to the



[*Sketch by Miss E. Richardson.*

FIG. 158.—DOUBLE CANOE OF HAWAIIAN ISLES, SHOWING CRAB-CLAW SAIL.

From a plate in *Cook's Voyages.*

number of at least fifteen thousand, besides others that were swimming and sustaining themselves on floats in the water."

La Perouse states that at one part of the coast of Maui, in the Hawaiian Group, one hundred and fifty canoes came off to his vessel.

Of the ordinary canoes of the Hawaiian Isles La Perouse wrote as follows: "These canoes had outriggers; each held from three to five men. The common size might be about twenty-four feet in length, only one foot in breadth, and very near the same in depth. We weighed one of them of these dimensions, which did not exceed fifty pounds weight. It is with these ticklish vessels that the inhabitants of these islands make runs of sixty leagues, and traverse channels that are twenty leagues wide."

Arago writes as follows of Hawaiian canoes in his account of Freycinet's voyage (1817–20): "Our cabinetmakers do not polish the most costly furniture better, and without planes or any of the tools employed by our workmen those of Hawaii are capable of competing with the best artisans of Europe. The inside of the bottom of their boats, as far as the thwarts, is painted black, and polished till it becomes very bright. . . . The largest canoe was a single one, seventy-two feet long, and three in its greatest breadth. The threads with which the planks were sewed together, and with which the other parts of the canoes and their outriggers were connected, were twisted and fastened with wonderful skill. The other canoes under the sheds were neither less elegant not less carefully finished, but the largest was not above fifty feet long."

Of the canoes of the Sandwich Isles [Hawaiian Isles] Ellis says: "The canoes of the Sandwich Islands appear eminently calculated for swiftness, being low, narrow, generally light, and drawing but little water. A canoe is always made out of a single tree: some of them are upwards of seventy feet long, one or two feet wide, and sometimes more than three feet deep, though in length they seldon exceed fifty feet. The body of the canoe is generally covered with a black paint. . . . On the upper edge of the canoe is sewed, in a remarkably neat manner, a small strip of hard white wood, from six to eight inches in width, according to the size and length of the canoe. These strips meet and close over the top at both stem and stern. . . . The mast generally has a notch cut at the lower end, and is placed on one of the cross-pieces to which it is tied. . . . Neither the canoes nor paddles are carved like those of many islands in the Pacific."

In describing a trip made in a double canoe at the Sandwich Isles, Ellis says: "We found our double canoe very convenient, for it had a *pora*, or stage, raised in the middle, which provided a comfortable seat, and also kept our packages above the spray of the sea. The *pora* is formed by tying slight poles to the *iako* [= *iato*—Maori *kiato*], or cross-pieces that connect the two canoes together. The cross-pieces are not straight, but bent like a bow, and form an arch between the two canoes, which raises the *pora*, or stage, at least two feet higher than the sides of the canoe."

Dr. Emerson, of Honolulu, has remarked: "The making of a canoe, from the first act of selecting a tree in the wilderness to its final consecrating and launching when fully rigged, was in Hawaii, at all times, and at every step, under the watchful eye of the *kahuna* [Maori *tohunga*—expert], whose duty it was to see that no pains or expense were spared, no ceremony omitted, to propitiate the favour of the gods who had the power, if so disposed, to bring good luck to the *wa'a* [Maori *waka*] and all who might sail in it."

In volume 1 of *Occasional Papers of the Bishop Museum of Honolulu* is an instructive article on "The Mat Sails of the Pacific," by Mr John F. G. Stokes. It gives some interesting information concerning the manufacture of canoe-sails from pandanus-leaves, from the native name of which the Maori derived one of his names for a sail, *whara*. He mentions the common custom of making such sails in several or many pieces, which pieces would be afterwards fastened together. These were plaited as is a Maori floor-mat, not laced together as was the *raupo* sail already described. "The Hawaiian sail was made in strips, but that of Tahiti seems to have been composed of several large square mats sewn together. . . . The Hawaiian sail was shaped somewhat like that of the Society Islands, but the top of the sprit was on a level with the masthead, near which it was held by a cord."

The following notes are from the *Bishop Museum Handbook*, Part I, 1915: "Hawaiian canoes were cut from single logs, usually of *koa*, long and narrow, without keel, built up with side boards of bread-fruit wood, and partly covered at each end, but especially at the bow. A very necessary part of the canoe was the *ama*, or outrigger, in the best canoes made of *wiliwili* wood (*Erythrina monosperma*), connected with the *moo*, or gunwale, by two curved sticks, *iako*, generally of *hau* wood (*Paritium tiliaceum*). Triangular sails of matting were attached to a short movable mast, *kia*. As protection from water and weather,

canoes were generally painted, the hull black, the *moo* yellow, and when not in actual use were drawn ashore. Canoes varied greatly in size, from that capable of carrying one man to the gigantic war-canoes carrying fifty or more; the latter were generally made of pine drifted from the American coast. . . . Paddles are usually of *koa*, rather heavy, and tipped on one face with a slight projection called *io*, or *upe*. This *io* was not always present. The average length of a paddle was five and a half feet. . . . While the steering-paddles were much larger than these, the paddles used by women was much smaller. . . . When another canoe was substituted for the *ama*, a raised platform was built over the *iako* [Maori *kiato*], and a very steady craft resulted. All parts of a canoe were bound together with sennit or *aha* [Maori *kaha*, a cord]. . . . Often the pious fishermen placed at the bow a two-headed god. . . . The anchor was either a perforated stone, or a round stone or several smaller ones enclosed in a net."

The dimensions of a fishing-canoe in the above museum are given as follows: Length, 35½ ft.; depth, outside 27 in., inside 23½ in.; width inside, 17½ in.; centre of canoe to centre of outrigger, 10½ ft.

Fornander tells us that, in olden times, large double canoes carrying eighty men were not uncommon. A old wrecked canoe on the coast of Hawaii was 108 ft. in length, and a certain canoe of Oahu, of the eighteenth century, carried from 120 to 140 men. In olden times the Hawaiians made long voyages to the south and west. Vancouver saw here a canoe 61 ft. in length that had been fashioned from a drift log of American pine.

Canoes of the Tonga Group.

The Tongans were the most adventurous deep-sea voyagers of Polynesia when the Pacific area became known to Europeans, hence the following description of the double sailing-canoes of that group will be of interest; it is taken from the Rev. T. West's *Ten Years in South Central Polynesia*:—

"Undoubtedly the Tongans stand foremost among the islanders of the Pacific Ocean in maritime ability and enterprise. Their large double sailing-canoes are beautifully constructed, and are admirably adapted for all ordinary purposes of native navigation. . . . Each hull is built from forty to ninety feet long. The breadth of beam in each hull amidships is from three to five feet, and this gradually diminishes fore and aft, leaving the two extremities exceedingly sharp. The greatest depth of hold is only from four to six feet. The two hulls are joined together at the gunwales by a strong platform of transverse beams and planking, extending about two-thirds of the length of the canoe from the centre, leaving a space longitudinally between the hulls of from five to twelve feet, according to their size. The planks of which the several hulls are built are cut to the required shape, and are flanged on their inner edges. These flanges admit of holes being bored, through which strong lashings of sinnet are passed, and thus the whole structure is bound firmly together without the use of a single nail or bolt of any kind. The platform, or deck, is fastened to the hull in a similar manner; and in the centre a small house is constructed. . . . None of the Tongan vessels have more than one mast or sail. The step of the mast is firmly fixed upon the deck, and is, in fact, a pivot on which the foot of the mast works, so as to allow it to move in a slanting direction, towards either end of the canoe, when going about, or according to the setting of the sail. The sail is composed of numerous pieces of light matting, and is in shape what sailors would call a shoulder-of-mutton sail. When hoisted the wide part is uppermost, and when tacking the sail and the two heavy yards to which it is attached are lifted by sheer manual strength from one end of the canoe to the other. The top of the mast is cut in the form of a crescent for the purpose of suspending the various ropes required in hoisting the sail. A rude kind of low railing round the edges of the platform, and on the top of the deck-house, is the only protection to the crew and passengers against the chance of being washed overboard. . . . Accidents of this sort are very rare."

This writer, in speaking of a fleet of fourteen such vessels seen by him, remarks that each of them would carry about a hundred or a hundred and fifty persons. In describing a trip made in one of these vessels he says: "Up went the huge sail, down went the great steer-oars, splashing into the sea, and away we shot like a racehorse. The breeze was strong. Every timber of the canoe creaked again, while the mast bent like a reed and cracked in its socket as if it would split the deck in two. . . . Owing to the great rate at which we were going, the sea was like a hissing cauldron on either side of our course, and the vessel, instead of having time to mount over the smaller waves, cut its way right through them. . . . We reached Lifuka safely in about three hours, having run a distance of thirty-eight miles. There cannot be a doubt that the peculiar shape of the Tongan *kalia*, or double canoe, and the arrangement of its large and single sail, are conducive to the attainment of great speed in ordinary weather. But in heavy weather and a rough sea these vessels are exceedingly unsafe. They have, however, been known to live through severe and long-continued storms, chiefly owing to the fact that, so long

[*Sketch by Miss E. Richardson.*

FIG. 159.—DOUBLE CANOE OF TONGAN GROUP, SHOWING PLATFORM DECK, RUDE CABIN, AND LATEEN SAIL.

From Webber's *Views in the South Seas.*

as they hold together and do not upset, they cannot possibly sink, owing to the strong platform joining the hulls together. They are highly adapted for sailing close upon a wind. The formation and position of the sail enables them to go at a good speed within even three points of the wind; so that, in this particular, they have a wonderful advantage over all sailing-vessels of European construction."

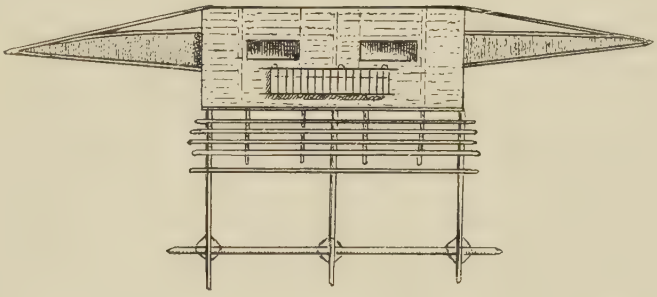
In the above account of the construction of Tongan vessels it is interesting to note that the curious method of lashing the planks together by means of holes through flanges or raised edges, such as was done at Samoa, obtained among the Tongans. This usage was probably introduced from Fiji, as also was the big type of double canoe with a lateen sail, described above, as its use was by no means universal among Polynesians. The Maori and natives of the Society and some other groups did not employ it. It is noteworthy that the topmost deep planks that support the deck in the Fijian vessel are not so lashed, not being provided with the rim beading, or flange; they are secured as is the *rauawa*

of a Maori canoe, with an outside batten over which the lashing passes, this join being above the water-line.

Forster noted that Tongan canoes were better finished than those of the Society Isles: "The workmanship of these boats was infinitely preferable, as they were joined together with an exactness which surprised us, and the whole surface had received an excellent polish. Their paddles had short broad blades, something like those of Tahiti, but more neatly wrought, and of better wood."

In his report on the South Sea Islands and their inhabitants, published in 1884, Mr. H. B. Sterndale wrote as follows of the Tongans and their vessels: "It is not too much to say that the Tongans from some very ancient time possessed a civilization peculiar to themselves. They have more moral stamina, energy, and self-reliance than any other existing race of the Pacific. Had they been acquainted, formerly, with the use of metals they would have subdued all Polynesia. Their immense war-canoes, rigged with a lateen yard a hundred feet long, and crowded with a whole tribe of several hundreds of people, in which they made voyages to Fiji, Samoa, and even to much greater distances, were miracles of patient ingenuity as concerns their construction, and needed indomitable daring for their navigation."

This writer gives some interesting notes concerning the Tongan invasions of Fiji and Samoa, and showing that they would probably have conquered the whole of the former group had not their operations been stayed by European Powers.



[*Sketch by Miss E. Richardson.*

FIG. 160.—OUTRIGGER CANOE OF TONGATAPU.

Illustrates a first step in the development of the decked vessel, the crew occupying the platform and not the hull of the canoe. From the *Voyage of the "Astrolabe."*

Of canoes of the Tongan Group, Forster wrote in 1774: "These people managed their canoes with surprising ability. . . . Their common trading-canoes were neatly made, and polished like those which I have already described. But those of the neighbouring islands [of the Tongan Group] were of a great size, and some of them contained upwards of fifty people. They always consisted of two large canoes, fastened by a transverse platform of planks, in the midst of which they had erected a hut, where they placed their goods, their arms and utensils, and where they passed a great part of their time. There were likewise holes, which gave admittance into the body of each canoe. Their masts were stout poles which could be struck at pleasure, and their sails were very large and triangular, but not very proper to sail by the wind. All their cordage was excellent, and they had also contrived a very good ground tackle, consisting of a strong rope with large stones at the end, by means of which they came to an anchor."

The previous description referred to above was that of the canoes of Tongatapu as seen in 1773, which is as follows: "These embarkations were of different construction. The common small trading-canoes were sharp-bottomed, and ended in a sharp edge at each extremity, which was covered with a board or deck, because their narrow form

frequently exposed these parts to an entire submersion, which would have filled them with water without this precaution. They commonly had a slight outrigger or balancer, made of a few poles, to prevent their oversetting. The body of the canoe consisted of several planks, of a hard brown wood, sewed together with strings made of the fibrous coconut core, and so artfully joined that they appeared to be remarkably tight. The Tahitians simply bore holes in each plank, through which they pass their strings; but by this means their canoes are always leaky. At Tongatapu they dub the inside of the plank in such a manner as to leave a projecting lift or rim close to the edge, and through this they pass their threads. Along the deck or narrow board at each extremity are placed seven or eight knobs, which seem to be an imitation of the little fins on the belly of bonitos, albicores, or mackerels; and I cannot but conjecture that the natives have taken these swift fishes for their models in the construction of their boats. Though these canoes are commonly fifteen or eighteen feet long, yet they are as neatly and smoothly polished as our best cabinet-work, which must appear the more surprising when we consider that the tools of the natives are only wretched bits of coral and rasps made of the skins of rays. Their paddles were equally well polished, of the same wood as the canoe, and had short, rhomboidal, broad blades, like those of Tahiti." In this account Forster deals with the small single canoe furnished with an outrigger. Here also we again note the knobs or projections at the end of the canoe, as seen at Manihiki and elsewhere.

Of the double canoe of Tongatapu Forster writes: "The planks were sewed in the same manner as in the common canoes; but they were covered all over, and had a kind of elevated stage or platform like the Tahitian war-canoes. Some of them may carry one hundred and fifty men; and their sails, which are latine, are made of strong mats, in which the rude figure of a tortoise or a cock, &c., is sometimes represented. . . . It appears probable from the good construction of the sailing-boats that the inhabitants of these islands are more experienced mariners than those of Tahiti and the Society Isles."

Labillardière speaks of Tongan canoes as seen by him in 1793, when a member of the d'Entrecasteaux expedition: "Several canoes with outriggers came out to meet us. . . . Each had two or three natives on board, seldom four. One of them coming towards us with too much speed, her outrigger gave way, and we had the sorrow to see the three rowers fall into the water. . . . These canoes are so slight that they must frequently be exposed to such accidents; and, indeed, their countrymen, who passed close by, seemed scarcely to notice it."

When another of these small canoes had its outrigger carried away by a ship's boat, two girls remained on board, while the men jumped overboard, two steadying the canoe while the third fixed up the outrigger. When these Europeans embarked in these frail craft they generally capsized them—"not being sufficiently careful in preserving our equilibrium"—hence they took to the use of double canoes.

The above writer continues: "The General received as a present a little canoe with an outrigger. . . . It was near ten feet long, a foot wide, and capable of carrying only two persons. These canoes are decked for about a fifth part of their length at each end, which is sufficient for them to navigate with security within the reefs; but their double canoes, being intended for the open sea, are decked throughout their whole length, except towards the middle, where a little opening is left for a man to go down and bale out the water when it is necessary. I saw with admiration that these people had consulted nature in constructing their canoes for speed. The bottom nearly resembles the under part of a fish of the cetaceous kind—the *Delphinus delphis*, the dolphin, which swims with the greatest swiftness."

The small canoes alluded to were those used within the sheltering reef; this writer has little to say concerning the seagoing vessels. At one place he saw a double canoe, 40 ft. long, under a shed; and in another shed "a war-canoe, 80 ft. long, the inside of which was strengthened by very stout knees, placed about a yard distant from each other." This latter was a double canoe captured at the Fiji Group.

Of the sailing-qualities of Tongatapu canoes the above writer remarks: "We soon got ahead of the canoes that were paddled along; but those with sails were obliged to slacken their rate of going to keep at a short distance from us, and we had an opportunity of observing that they would have taken the lead of our vessels considerably if they had availed themselves of the whole force of the breeze; this advantage, however, they would have soon lost if the wind had been stronger and the water less smooth."

The accounts of these Tongan deep-sea vessels, furnished with stout knees, decked over, and propelled by big sails, show the Tongans to have been the most advanced ship-builders of Polynesia. Adventurous navigators in big decked double canoes that could sail thirteen miles an hour would command all the *ara moana* (sea-roads) of the Pacific.

Many of the Tongan canoes, especially the double canoes, were very large—80 ft. or 90 ft. long—and carried two hundred men. The style of Tongan canoe that was sailed with either end foremost is said to have been borrowed from Fiji.

Mariner speaks of a force of five thousand Tongan warriors, and a thousand women, being conveyed to Vavau in fifty canoes.

Mr. Fenton has the following in his *Suggestions for a History of the Origin and Migrations of the Maori People:* "The Rev. Mr. Lawry, in his *Visit to the Friendly Islands* (1851), says that he measured a canoe and found it to be ninety feet long, with a sail ninety feet high and sixty feet wide at the top; adding that the canoes sail very fast and near the wind. He mentions the arrival at Tonga of a fleet of double canoes."

Of the Tongan canoes Angas writes: "Their largest canoes are all built in the Fijis, and are some of them upward of a hundred feet in length. These are termed 'double canoes' by Europeans, although the second or attached body is merely an outrigger, composed of a tree hollowed for the sake of buoyancy, like the canoe itself." D'Urville's illustrations of Tongatapu outrigger canoes show both ends decked over, and three booms connected with the float by means of short rods. One shows a top-strake extending along the side as far as the hold is open, and one has a lateen sail. Another form shows the hold decked over with the exception of two comparatively small openings; a platform extending out on the booms serving, no doubt, to accommodate some of the crew. An illustration of a double canoe shows a platform extending over both canoes and the space between them, upon which a cabin is erected. The lateen sail has two yards (or yard and boom), as was usual in this region, and is shown both set and furled. Unlike the Maori form of sail (*ra kautu*), this lateen sail could be furled without unshipping and lowering the mast.

During his visit to the Tongan Isles in 1774 Cook examined the big double canoes propelled by sails, and gives us the following description:—

"I had now an opportunity to verify a thing I was before in doubt about, which was, whether or no some of these canoes did not, in changing tacks, only shift the sail, and so proceed with that end foremost which before was the stern. The one we now saw wrought in this manner. The sail is lateen, extended to a lateen yard above, and to a boom at the foot; in one word, it is like a whole mizzen, supposing the whole foot to be extended to a boom. The yard is slung nearly in the middle, or upon an equipoise. When they change tacks they throw the vessel up in the wind, ease off the sheet, and bring the heel or tack end of the yard to the other end of the boat, and the sheet in like manner; there are notches, or sockets, at each end of the vessel in which the end of the yard fixes. In short, they work just as those do at the Ladrone Islands, according to Mr. Walter's description (see Lord Anson's voyage). When they want to sail large, or before the wind, the yard is taken out of the socket and squared.

"It must be observed that all their sailing-vessels are not rigged to sail in the same manner. Some, and those of the largest size, are rigged so as to tack about. These have a short but pretty stout mast, which steps on a kind of roller that is fixed to the deck near the fore part. It is made to lean or incline very much forward; the head is forked, on the two points of which the yard rests, as on two pivots, by means of two strong

cleats of wood secured to each side of the yard, at about one-third its length from the tack or heel, which, when under sail, is confined down between the two canoes by means of two strong ropes, one to and passing through a hole at the head of each canoe; for it must be observed that all the sailing-vessels of this sort are double. The tack being thus fixed, it is plain that, in changing tacks, the vessels must be put about; the sail and boom on the one tack will be clear of the mast, and on the other it will lie against it, just as a whole mizzen. However, I am not sure if they do not sometimes unlace that part of the sail from the yard which is between the tack and masthead, and so shift both sail and boom leeward of the mast. The drawings which Mr. Hodges made of these vessels seem to favour this supposition, and will not only illustrate but in a manner make the description of them unnecessary. The outriggers and ropes used for shrouds, &c., are all stout and strong. Indeed, the sail, yard, and boom are all together of such an enormous weight that strength is required."

Captain Erskine has left us the following account of Tongan canoes as seen by him in 1849: "In one of the lofty canoe-sheds on the beach we inspected the king's great double canoe, as those of the largest class are called by Europeans, although the second or attached body is merely an outrigger, composed of a tree hollowed out for the sake of buoyancy, like the canoe itself. Even the hull of the main canoe is seldom occupied by passengers or crew, excepting one who is constantly (when at sea) employed in bailing, the seams of the planks, which are still lashed together with coconut plait, not being impervious to the water. Beams are laid between the two bodies, on which is erected a house with a shelving roof, the receptacle for provisions. Over this again rises a platform surrounded by a railing, forming the deck or place of general resort. The canoe in question was upwards of one hundred feet in length, and, like all of those dimensions, had been built at Fiji, these islands affording no timber fit for the purpose."

This writer has the following note on the plan adopted by Tongans when they wished to put about with one of these craft: "The operation was effected by throwing the canoe up into the wind, when the rake of the mast, which is stepped on a kind of hinge, and always inclines forward, was reversed, and at the same time a number of men, clapping on the tack of the sail, or the point where the yard and boom meet, hauled it aft; the yard, being nicely poised in the slings and hoisted over a fork at the masthead, then swung round, and the 'unwilling tack' was dragged to the loop or becket, into which it was inserted at the other end of the vessel." This writer notes that the canoe spoken of was sailing at about the rate of seven knots.

Canoes of the Samoan Isles.

From the account of the voyage of La Perouse (1785–88) we take the following remarks on the smaller type of Samoan canoes, such as were used in home waters: "Their canoes have outriggers, are very small, and generally contain only five or six persons: some few, however, may contain as many as fourteen. They do not appear to deserve the praise that navigators have bestowed on their swiftness. I do not think when under sail that it exceeds seven knots; and with their paddles they could not keep way with us when we were running only four miles an hour. These Indians are such excellent swimmers that their canoes seem only to serve them to rest themselves in. As upon the least false movement they fill, they are obliged every moment to leap into the sea, take up their sinking vessels upon their shoulders, and pour out the water. They sometimes join two together by means of a cross-piece of wood, in which they make a step to receive the mast. In this way they are less likely to overset, and can preserve their provisions during a long voyage. Their sails are of matting . . . are extended by a sprit, and do not deserve a particular description. . . . They are so light that two men can carry them upon their shoulders with ease."

It is clear that the writer here refers to the small canoes employed for harbour or coastal use; the Samoan deep-sea vessels were a quite different type. Further on he says of these small canoes, "There were some of them extremely small, containing only a single man, and covered with ornaments . . . the slightest contact of the other canoes overset them every moment." This oversetting every moment must certainly have been somewhat of a drawback.

Missionary Turner described the superior type of Samoan single canoe as a keel of one piece, 25 ft. to 50 ft. long, "and to that they added board after board, not by overlapping and nailing, but by sewing each close to its fellow, until they had raised it some two, or it might be three feet from the ground. These boards were not . . . uniform, but were a number of pieces varying in size from eighteen inches to five feet long." The joins were served with a vegetable gum to render them watertight.

These craft were carvel-built, the common Polynesian style, and the planks were lashed together in the Fiji-Tongan manner by means of passing lashings through cants or flanges on their inner edges. As Turner says, "The sewing only appeared on the inside. Outside all was smooth and neat, and it was only on close inspection you could see that there was a join at all." These canoes were from 18 in. to 30 in. wide, and, of course, provided with an outrigger. The sail was the usual triangular one of matting, set with the apex downwards, as in other groups. In former times the Samoans built large double canoes.

The author of the *Cruise of the "Fawn"* (1862) remarks: "On excursions outside the harbour large canoes are used, which carry from forty to fifty people. They are from thirty to sixty feet long; the keel is of one piece, and the sides are built up not with long planks, but with pieces of wood of irregular sizes and shapes, split out and smoothed with the hatchet, and most ingeniously stitched together with coconut sinnet, the lashings being passed through a rim left on the inner edge of each board. The canoe is made perfectly watertight with the gum obtained from the breadfruit-tree; and with such extreme nicety are the joints fitted that, on the outside, where the sewing is not visible, it is scarcely possible to detect them without very close inspection. Along the bow and stern is generally a row of white shells (*Cypraea ovula*), and some have a raised prow thickly studded over with these shells, and, above, the figure of some bird or beast. . . . The common canoes in daily use are merely hollowed logs, with rough outriggers."

The same writer describes a large Samoan double war-canoe seen by him as follows: "Though clumsy-looking, and apparently unsafe, these vessels sail very fast, and seldom meet with serious catastrophies. They are very wet, bailing out being an incessant operation. The larger canoe is seventy feet long, and about five feet deep, built in the usual Samoan fashion with pieces of wood of irregular sizes and shapes; the lesser canoe serving as an outrigger, fifteen feet shorter, and of much smaller dimensions every way. Over both is a strong deck, having accommodation for one hundred men; there are holes through this for paddles to be worked between the two boats; and on it a house, thatched, with cooking-place and other conveniences. Over all is a small platform upon which the chief sits, exposed to wind and weather. The masts and yards are very heavy, as are the cumbrous sails of coconut matting, which, however, they manage with great dexterity, and which are so efficient that this canoe sailed round a vessel, in which the Consular Agent was a passenger, going eight knots. When attacking a fort they have around the deck a high bulwark of coconut stems, loopholed for musketry."

Lieutenant Walpole, in his *Four Years in the Pacific*, states: "As the planks are not of sufficient length, they are likewise joined by sewing, the ends having been cut into the shape of a capital M and W, which fit close to each other. A broader streak covers the whole, and an outrigger keeps what would be but a frail conveyance steady in the water." This is quite a new feature, this dovetailing, and it is not mentioned by other

writers. Is it an introduced usage? It resembles the *haumi* join. If introduced, it did not, apparently, extend to other parts of Polynesia. Nor is anything said of the rim lashing, or the position and securing of the batten.

In the account of Samoan canoes given in Commander Wilkes's story of the United States Exploring Expedition appears the statement, "They have no large double canoes such as are seen at Tonga and Fiji." Evidently by 1840 such vessels were no longer used, but in previous generations Samoans employed such craft in making long ocean voyages.

The Rev. J. B. Stair notes the disuse of the *va'a tele*, or big double canoes, formerly used by the natives of Samoa. "The *va'a tele* . . . differed materially from the small double canoe, the *alia* at times now used. This is indeed a copy of the Tonga double

[*By permission of Tattersall's Studio, Apia.*

FIG. 161.—DOUBLE CANOE OF SAMOA: THE ALIA TYPE.

Herein we note another step in the development of decked vessels.

canoe. The *alia* is formed by lashing two canoes of nearly equal length together by stout cross-pieces, which are securely fastened into the gunwales, and upon this stage, in the centre of the canoe, a thatched shed is placed for the accommodation of the crew. [See fig. 161.] In the *va'a tele*, or great canoe, one body of the canoe was much longer than the other, and instead of the shed being built in midships it was placed on a stage that projected far over the stern. It differed also in the rig, and was altogether more difficult to manage than the *alia*, which has superseded it. The last of these once-famous canoes was in existence in Samoa when I reached there in 1838. These large canoes must have been of considerable size, since, upon the fishing expeditions made at certain seasons of the year to a reef midway between Wallis Island

and Savai'i, they were accustomed to carry two *va'a alo*, or large fishing-canoes, on the deck, which, on reaching the reef, were used in fishing for bonito, &c., the large canoe being reserved for crew and cargo."

The above is taken from a paper on "Early Samoan Voyages and Settlements," published in the *Report of the Australasian Association for the Advancement of Science*, 1895.

Mataafa, a prominent chief of Samoa, once stated that the *alia* consisted of two or more canoes bound together. The latter part of this statement reminds us of the *lakatoi* of New Guinea.

Mr. J. B. Fleck tells me that when at Samoa he saw canoes the lower planks of which had been lashed together by the interior rim or cant method, but that the top-strakes were lashed on in Maori style.

Of the single canoe furnished with an outrigger Wilkes wrote as follows in 1839: "The largest canoes are from thirty to sixty feet long, and capable of carrying from ten to twelve persons. They are formed of several pieces of plank fastened together with sennit. These pieces are of no regular size or shape. On the edge of each plank is a ledge or projection, which serves to attach the sennit, and to connect and bind it closely to the adjoining one. It is surprising to see the labour bestowed on uniting so many small pieces where large and good planks might be obtained. Before the pieces are joined, the gum from the fruit of the breadfruit-tree is used to cement them close and prevent leakage. These canoes retain their form much more truly than one would have supposed, and I saw few whose original model had been impaired by service. On the outside the pieces are so closely fitted as frequently to require close examination before the seams can be detected. This perfection of workmanship is astonishing to those who see the tools with which it is executed. They are now made of no more than a piece of iron tied to a stick, and used as an adze. This, with a gimlet, is all they have, and before they obtained these iron tools they used adzes made of hard stone. These canoes are built with a deck forward and aft. They are long and narrow, and their shape is elegant. They are paddled by natives who sit two abreast, and are guided by a steersman. The seat of honour is on the forward deck, in the centre of which is a row of pegs, to which the large white ovula shell is attached by way of ornament. . . . Having both a prow and stern, these canoes cannot be manœuvred without tacking; consequently the outrigger that constitutes their safety is, in using their sail, alternately to leeward and windward, and does not, when to leeward, add much to the stability of the canoe. They carry less sail than the canoes of the other natives of Polynesia, and, to guard against the danger of upsetting, the natives rig a sprit or boom (*suati*) projecting from the opposite side to that on which the outrigger is fitted. This boom is secured with guys to the top of the mast. When the wind blows fresh some of the men go out upon it, and thus balance or counteract the force of the wind. Those on the other side of the canoe are kept ready to go out on the outrigger when that becomes necessary. The sail is made of a mat, of a triangular shape, with its apex below: some of these are ten feet high."

"The old Samoan double canoe," writes G. Brown in his *Melanesians and Polynesians*, "has long been extinct, and the one which has been used of late years was modelled after the Fijian fashion, and in most cases was obtained from the Tongans, and of this there is only one specimen in Samoa at the present time. The ordinary canoes in use were the rough dugout used for fishing inside the reef, and a larger one of the same kind called *soatau*, which sometimes had the bow decked over. The beautiful carvel-built canoes to carry four were principally used for bonito-fishing. . . . They were generally built of breadfruit planks sewn on to a keel made of greenheart. After the same model, but much larger, were the dolphin-canoes, which were built with four seats for eight people, besides the steersman, or with five seats for twelve persons. These canoes carried a large sail. . . . All these canoes had outriggers, and in the case of the sailing-canoes they had one on both sides. If the breeze was strong, one of the crew stood on the windward

side, going out farther and farther as the wind increased, and especially as the canoe was struck by a squall, and stepping inboard as it slacked. They were very skilful indeed in the management of these beautiful canoes. The paddles had a broad blade with round shoulders running away to a point. . . . The sails were made of mats, and something like a leg-of-mutton sail with the broad side uppermost. The ropes were made of the bark of *Hibiscus tiliaceous*. All the carvel-built canoes were fastened together by sinnet passing through holes gouged in a projecting part of the edge of each plank. The planks were fitted by rubbing turmeric along the edges; these were rubbed together, and any part not properly jointed was at once shown by the absence of the turmeric mark on it. They were afterwards caulked with gum obtained from breadfruit-trees, spread on both sides of strips of native cloth, and placed between the planks before they were sewn together. After the canoe was finished it was rubbed with a species of coral used as pumicestone. The outrigger was made out of the log of some light tree, which was fastened to the canoe by means of cross-bars, one being fastened behind each seat to both sides of the canoe. From the end of these bars strong sharpened sticks were pierced in the upper side of the outrigger, and lashed to the cross-bars, and the whole was kept in place by lashings of sinnet passing round the outrigger."

Of canoes seen at the island of Manua in 1849 Captain Erskine, of H.M.S. "Havannah," remarked: "The canoes we saw were small, built of separate pieces of timber tied together, with the usual outrigger, and the covered part or deck ornamented with a row of white cowries (*Cypraea ovula*). The larger canoes seemed to be hauled up under thatched sheds."

In describing a sojourn at Tutuila the same writer remarks: "We saw some of their larger canoes, in which they make voyages to the neighbouring islands. They are capable of holding fourteen paddlers, besides a sitter, and are similar in construction to the smaller canoes, although in addition to the floating outrigger they have a long spar projecting to windward, on which stands one of the crew as ballast, regulating his distance from the gunwale according to the strength of the breeze. The one sail is of matting, narrow at the head, and set between two masts. They have no way of reefing, and are said to be often blown off the coast, and are sometimes lost. They cannot beat to windward, although they seem to hold a tolerable wind; consequently, for communication with Manua, must await a north-wester, which even in the most regular season of the trades occasionally blows for three days at a time."

Canoes of the Gilbert Islands.

The outrigger canoes of the Gilbert Islands show a top-strake that does not extend to the ends of the hull, according to a German publication, the rising ends of the dugout hull covering the ends. The lashing looks like the Maori style. The booms are straight, and attached by means of short pieces to the float. The three booms are all grouped near the middle of the float. With regard to the outrigger canoe of Nauru, or Pleasant Island, the same remarks may be applied to booms and float.

A model canoe from the Gilbert Group is 3 ft. 3 in. in length. It is a sailing-canoe provided with an outrigger, and apparently made to sail both ways, the two ends being equally pointed. The keel is remarkably sharp, and composed of three pieces, the two end pieces carrying the curvature of the two ends up to the level of the sides; thus the ends of the top boards are butted against the upward sweeping ends of the two *haumi*. Two strakes, each composed of three pieces, compose the upper sides. These planks are fitted carvel fashion, and secured to each other and to the keel by means of lashings passed through holes bored near the edges, as practised by the Maori, except that no covering battens are employed. All these lashings are countersunk on the outer side, except those which secure the two *haumi* to the main part of the keel. A remarkable feature is noted in nine pairs of ribs carefully fitted inside the hold, and to which the side boards are secured by lashings passed through holes bored in the planks. The hold

is partly decked over on a level with the gunwale, and accommodation for paddlers seems to be lacking. Eleven cross-pieces let into the top-strake support the half-deck and act as braces, nine of them being immediately over the nine sets of ribs.

Three booms connect the outrigger with the canoe, the inner ends of the boom being carried across the canoe and acting as three of the braces and deck supports. Five longitudinal spars connect the booms with each other. The float is a solid-hewn balk pointed at both ends, and connected with the booms by means of short wooden prongs of Y form, the shanks of which are apparently inserted in the float, to which they are also attached by means of lashings passed right round the float. The two prongs of each Y are in alignment with the booms, which are lashed to both. Narrow strips of some leaf are inserted in all plank-joinings.

The mast is stepped in a wooden bucket or socket lashed to the deck amidships; its other supports consisting of a wooden strut, the floor of which is secured to the middle boom, also fore and aft stays, and three braces, two of which are secured to the outrigger. The sail is triangular, secured to sprit and boom, apex downward. It was apparently rigged as a lateen sail.

Two model paddles are made in two pieces, the blade being lashed to the handle.

Canoes of the Loyalty Isles.

Captain Erskine, of H.M.S. "Havannah," remarks as follows on a canoe seen at Uea Island, Loyalty Group: "These came in one or two large double canoes resembling those of Fiji, but of much clumsier construction and coarser workmanship. A platform or deck was built over the two bodies, and a rail or balustrade ran along one side, to prevent either men or implements from slipping overboard. They were rowed in a clumsy manner, without rowlocks, by large paddles, another of which was used as a scull, to steer the vessel, the exertions of the people being great and the speed small."

The Loyalty Isles are situated far within Melanesia, but on Uea Island dwells a community of Polynesians, whose forbears are said to have come from Wallis Island, west of Samoa.

In a paper on Rotuma, an island lying between the Samoan Group and Tikopia, the Rev. W. Allen remarks: "Canoe-building used to take up a great deal of the men's time. They made large double canoes. These, with their rude stone axes, took many years to build, often eight or ten. No nails were used; everything was fastened together with sinnet. With these they were enabled to reach Tonga and other places. Some, doubtless, were lost at sea with all on board. According to tradition, many years ago the island was overcrowded, and it was considered necessary to build canoes and sail away in quest of other lands on which to settle the people. At the present time there are no double canoes on the island, but some small single ones used for fishing about the reefs." The natives of Rotumah (Rotuma) appear to be a Polynesian folk.

Melanesian Canoes.

There are points of resemblance between the vessels of Melanesia and those of Polynesia, and this may have come about by all island forms having been evolved from common prototypes. There are other circumstances and probabilities that may be taken into account, such as contact of island peoples. The ancestors of the Polynesians, when entering the central and eastern Pacific, probably passed through the darker peoples of the west. In later times Polynesians have certainly come into contact with Melanesians, not only along the dividing-line between the two races, but also the former have made many voyages to the westward. Some of these expeditions were forays or raids, some were probably voyages of exploration, while yet others were involuntary drift voyages. It is unquestionably a fact that drift voyages have been a very important

factor in the settlement of the far-spread isles of the Pacific, and a considerable amount of evidence under that head has been collected. In the meantime we will scan the forms of vessels used in Melanesia and other Pacific regions.

Canoes of Fiji.

Here again we note the two usual forms of canoe—the double canoe, and the single vessel provided with an outrigger.

The single outrigger canoe of Fiji, as seen in 1829–31 by the writer of *The Wreck of the "Glide,"* is described as follows: "The single canoe is furnished with an outrigger—that is, a stick of timber about the length of the canoe and parallel with it. Into the upper part of this log small but strong sticks are placed vertically and close together, as high as the top of the canoe. Over them and the side of the canoe is a bamboo platform like that in the double canoes. The object of the outrigger is to prevent upsetting."

In speaking of a canoe seen at the Fiji Group, Wilkes, of the United States Exploring Expedition, says: "It had a magnificent appearance, with its immense sail of white mats; the pennants streaming from its yard. . . . It was a single canoe, one hundred feet in length, with an outrigger of large size, ornamented with a great number of the *Cypraea ovula* shells; its velocity was almost inconceivable, and every one was struck with the adroitness with which it was managed and landed on the beach."

Of a Fijian chief Wilkes writes: "When Tanoa launches a canoe, ten or more men are slaughtered on the deck, in order that it may be washed with human blood."

Three canoes were seen by Wilkes in course of construction at one of the Fiji Isles. One of these was 102 ft. long, 7 ft. wide, and 5 ft. deep; the other two were somewhat smaller.

The following description of Fijian canoes was written by a member of the crew of the "Glide," a vessel that visited the group in 1829, and was wrecked there in 1831: "The Fijians have two sorts of canoes, double and single. The double canoe is so called from its having two canoes, of nearly equal size, placed parallel with each other and about four feet apart, and covered with a platform of bamboo sticks. The canoe is furnished with a mast, grooved in the top to admit the halyards. The sail is triangular in form, and is made of straw mats sewed together. Some of these double canoes are nearly as long as a ship, and will carry from three to four hundred men."

The same writer is responsible for the following: "The Friendly-Islanders frequently ply their large double canoes to and from the Fijis, a distance of about three hundred miles. Taking advantage of favourable winds, and directing their course in the daytime by the sun, and in the night by the moon and stars, they rarely deviate from a straight course between the groups. I have frequently seen their canoes sailing in a heavy sea at the rate of nine or ten knots an hour. The incredible swiftness of these canoes I regard as an argument in support of the supposition which refers the origin of this people to the Asiatic continent."

When this writer and some of his shipmates were pursued by Fijians in canoes they escaped by putting their boat square before the wind, when they "at last gained upon the natives, who could not follow at so great an advantage, on account of the peculiar construction of their canoes. They are extremely sharp at both ends, with the mast stepped in the middle. The sail is in a triangular form, with the leach and luff confined to yards that meet at a point and rest on the extreme end of the canoe. The halyards are made fast at the middle of the upper yard or luff of the sail, so that, in beating, the sail is shifted from one end of the canoe to the other, without putting her about. Thus the weight of the sail, with the pressure of the wind upon it, causes the canoe to run under instantly when set directly before the wind."

This writer states that, in the Fijian double canoe, the two vessels are about 4 ft. apart, and that they will carry several hundred men.

The Feejee canoes are superior to those of the other islands. They are generally built double, and those of the largest size are as much as a hundred feet in length. The two parts of which the double canoe is composed are of different sizes, and are united by beams, on which a platform is laid. The platform is about fifteen feet wide, and extends two or three feet beyond the sides. The smaller of the two canoes serves as an outrigger to the other. The bottom of each of the canoes is of a single plank; the sides are fitted to them by dovetailing, and closely united by lashings passed through flanges left on each of the pieces. The joints are closed by the gum of the breadfruit-tree, which is also used for smearing them over. They have generally a depth of hold of about seven feet, and the two ends, for a length of about twenty feet, are decked over to prevent the canoe from shipping seas. Amidships they generally have a small thatched house or cuddy, to protect the crew from the weather, above which is a staging on which there is space for several people to sit. The frames of the canoes which belong to chiefs are much ornamented with shells.

The sails are so large as to appear out of all proportion to the vessel, and are made of tough yet pliable mats. The mast is about half the length of the canoe, and the yard and boom are usually twice as long as the mast. The mast is stepped on deck in a chock. The halyards are passed over a crescent on the head of the mast. These are bent on nearly the length of the mast, from the tack of the yards.

The natives are very expert in managing these vessels, and it requires no small skill in beating against the wind to do so. In sailing the canoe it is always necessary that the outrigger should be towards the weather side: this is easily effected by proper care. The mode of tacking becomes therefore curious, and is performed by putting the helm up instead of down. When the wind is thus brought aft, the tack of the sail is carried to the other end of the canoe, which now becomes the bow, and the course on the other tack is then pursued. If the outrigger gets to leeward while the canoe is under sail some accident always happens, for no kind of vessel is so easily overturned; and yet, when they are properly managed, they will carry sail when it blows heavily, and still preserve almost an upright position: this is effected by the natives going out on the outrigger, and thus counterbalancing the force of the wind by their weight. The canoes are made of logs hollowed out and built upon, and show a great deal of ingenuity: they are capable of making long voyages. . .

It is the custom for the chief always to hold the end of the sheet; thus it is his task to prevent the danger of upsetting. They steer with an oar having a large blade. In smooth water these canoes sail with great swiftness, but from the weight and force of the sail they are much strained, leaking at times very badly, requiring always one and sometimes two men to be constantly bailing out the water.

The planks are brought into and kept in shape by small ribs, almost exactly as in our mode of boat-building.

The following are the dimensions of a double canoe of the most common size: Length of the larger canoe, 70 ft.; length of the smaller canoe, 55 ft.; distance of the canoes apart, 7 ft.; length of the platform, 30 ft.; breadth of the platform, 15 ft.; cuddy, 15 ft. by 6 ft.; height above water, 10 ft.; draught of water, 2 ft. to 3 ft.; length of yards, 15 ft., 35 ft., and 60 ft.; length of mast, 35 ft.

From *Cruise of the "Alert,"* 1878–82, by Dr. R. W. Coppinger: "In a few years hence the old Fijian double canoe (consisting of two canoes placed side by side, and connected by a bridge) will be seen no more; but we were lucky in having an opportunity of seeing one good specimen at Bau. It was hauled up on a slip beneath a large thatched shed; and, although by no means one of the largest of its kind, yet it greatly exceeded my expectations. The depth of hold was about five feet, so that, standing on the bottom of either canoe, my neck was just on a level with the edge of the hatch, and the total length of each canoe was seventy-two feet; but what most surprised me was the enormous size of the mast, which lay alongside the vessel. It was about the size of the 'Alert's' spanker-boom. This canoe was intended to carry two hundred and fifty men, and I have no doubt it would hold that number."

In the *Transactions of the Fijian Society*, 1915, appeared a paper on Fijian canoes written by a native, and translated by Mr. G. A. Beauclerc. In this paper the following types of canoe are described:—

1. The *takia*. A small dugout canoe with outrigger, propelled by paddlers only, used for river and longshore work.

2. *Wanga vakatau.* A dugout vessel with top-strakes attached; these are termed *bava.* The ends are covered in with pieces called *tau.* With this canoe two forms of sail are used—the *vakasave,* which is hauled up the mast, and the *dumu,* which is apparently attached to the mast and the whole lifted together.

3. *Thamakau.* A large sailing-canoe provided with an outrigger. It is sometimes made in two pieces, in which case it is described as a *veikoso.*

4. *Wanga drua,* or double canoe. A built-up vessel. The keel-piece, termed *takele* [*cf.* Maori *takere*] is in two parts, which, like the *haumi* of a Maori canoe, are kept rigid by the side planks lashed to them. Series of planks are attached on each side, each series having a distinctive name, the uppermost ones being the *bava.* In this vessel the log outrigger is replaced by a plank-built canoe, hence this type may be termed a double

[*Sketch by Miss E. Richardson.*

FIG. 162.—OUTRIGGER CANOE OF FIJI, WITH LATEEN SAIL. (See also fig. 3, p. 14.)

From *D'Urville's Voyage.*

canoe. The lashings of the various planks are not visible on the outside, and joins are remarkably close and neat. The two vessels are connected by cross-beams, and a house or cabin is built on the deck. It requires many men to manipulate the sails of these large vessels from forty to a hundred. The steer-oar is very heavy, and needs powerful men to control it in a fresh wind. At such times bailers are busy in both hulls.

The sails of these vessels are made from leaves of the pandanus. The yards of the lateen-like sail are hoisted by means of halyards passed through a hole at the top of the mast, or over a crotch.

The mingling of Polynesians with the Melanesian folk of Fiji in former times seems to be reflected in the language. Thus in Fijian we note Maori terms in canoe

nomenclature, as in *wanga*, or *wanka*, a canoe (Maori *waka*); *drua*, a double canoe (Maori *rua* = two); *thama*, outrigger of a canoe (Maori *ama*); *maulailai*, small end of a canoe, &c. Also, *wanka* bears in Fijian the same double meaning (1, canoe; 2, the shrine of a god) that *waka* does in Maori.

Farther west, north of the New Hebrides, we find the lone isle of Tikopia occupied by a Polynesian people, a Maori folk speaking a Maori tongue. The island was probably settled by Tongans. Isolated from their Polynesian kindred, surrounded by Melanesians, these folk have preserved their racial speech. Hence in their vocabulary we find *vaka*, a canoe; *kiato*, booms; *ama*, outrigger; *foe*, paddle; *puke*, deck at each end of a canoe, covered-in ends; *hono*, top-strake.

D'Urville gives us an illustration of an outrigger canoe of Fiji showing five booms connected with the float by means of short pieces, as at Tongatapu. (See fig. 162.) Another plate shows two booms only, but these are strengthened by two diagonal side braces. The mast inclines forward, while the triangular sail is practically vertical, apex downwards as usual; a man at the stern wields a big steer-oar. About six stays support the mast.

Extract from Williams's *Fiji and the Fijians*, volume 1:—

Four classes of canoes are found in Fiji: the *velovelo*, the *camakau*, the *tabilai*, and the *drua*. All these have various modifications of the outrigger (*cama*),* and are distinguished by peculiarities in the hulk [hull ?]. The *velovelo* (or, more properly, the *takia*) is open throughout its length like a boat, and the spars to which the *cama* is secured rest on the gunwale. The *camakau*, as its name imports, has a solid spar for its *cama*: the hull has a deck over the middle third of its length, twice its own width, and raised on a deep plank built edgeways on each gunwale. Between the edge of this deck and the outrigger all is open. The projecting ends of the canoe, which are lower than the main deck or platform, as much as the depth of the plank on which it is raised, are each covered with one solid triangular piece of wood, hollowed underneath, and thickest at the broad end next the centre deck, to which it thus forms a gradual ascent. The two ridges formed by the hollowing underneath on the sides of the triangle are united to the edge of the hull, so as to completely box it up. The rig of the *camakau* is the same as that of the double canoe to be described presently; and from the small resistance this build offers to the water it is the "clipper" of Fiji, and the vessel described under the name of *pirogue* in the *Imperial Dictionary*.

The *tabilai* is a link between the *camakau* and *drua*, and is made with the outrigger of either. It is often of great length, several feet at each end being solid wood, cut away something like the hull of a ship sternward, the stern-post of the ship representing the cut-water of the canoe, which, instead of being sharp, presents a square perpendicular edge to the water. This is the same at both ends, and is distinctive of the class.

The *drua*, or double canoe, differs from the rest in having another smaller canoe for its outrigger, and the deck is laid across both.

When not more than thirty or forty feet long, canoes are often cut out of a single tree, and require comparatively little skill in their construction. When, however, a first-class canoe is to be built the case is far otherwise, and its creditable completion is a cause of great triumph.

A keel is laid in two or three pieces carefully scarfed together. From this the sides are built up, without ribs, in a number of pieces varying in length from three to twenty feet. The end of each piece has on the inside a flange; as the large pieces are worked in, openings of very irregular form are left, to be filled in as suitable pieces may be found. When it is recollected that the edges of the planks are by no means straight, it will be seen that considerable skill is required in securing neat joints; yet the native carpenters effect this with surprising success. After the edges are fitted together, holes of about three-eighths of an inch in diameter are bored a hand-breadth apart in them, having an oblique direction inwards, so as to have their outlet in the flange; the holes in the edge of the opposite board are made to answer these exactly. A white pitch from the breadfruit-tree, prepared with an extract from the coconut-kernel, is spread uniformly on both edges, and over this a strip of fine *masi* is laid, which is burnt through with a small firestick where it covers the holes. The piece of *vono* is now ready for fixing, which is done by what is commonly but wrongly called "sewing": the native word better describes the process, and means "to bind." The *vono* being lifted to its place, well-plaited but not large sinnet is passed through the hole in the top flange, so as to come out through the lower one; the end is then inserted in the sinnet farther on, and the sinnet run rapidly through the hole, until eight or twelve loose turns are taken; the inserted end is then sought

* The *c* in Fijian equals *th*.

and laid on the round projection formed by the united flanges, and fastened there by drawing one turn of the sinnet tightly over it; the other turns are then tightened, the last one being made a tie to the last. The spare sinnet is now cut off close, and the operation repeated at the next hole. The bindings, already very strong, have their power increased by fine wedges of hard wood, to the number of six or seven, being driven in opposite directions under the sinnet, whereby the greatest possible pressure is obtained. The ribs seen in canoes are not used to bring the planks into shape, but are the last things inserted, and are for securing the deep side boards described below, and uniting the deck more firmly with the body of the canoe. The outside of the *vono* is now carefully adzed into form, and the carpenter has often to look closely to find the joint. When the body of the canoe is cleaned off and rubbed down with pumicestone the surface is beautifully smooth. Of course, no signs of the fastenings are seen outside. This process is not used in fixing the deep planks which support the main deck, or the triangular coverings of the two ends already described. These, as shown in the section, being on top of the gunwale and above the water-mark, the sinnet is seen at regular intervals passing like a band over a flat bead which runs the whole length of the canoe, covering the joint and making a neat finish. Into the upper edge of planks, two or three feet deep, fixed along the top of the sides perpendicularly, the cross-beams which join on the outrigger are let and lashed down, and over these a deck of light wood is laid. The scuttle-holes for bailing are left at each corner. The deck also has six holes forward and six aft, through which to work the sculling-oars, used in light winds to help the sail, or when dead calm or foul wind makes the sail useless. A small house or cuddy is built amidships, in which boxes or bales are stowed, and on a platform over it persons can lie or sit; a rack behind it receives guns and spears, and clubs or baskets are hung upon it. The projecting ends of the canoe are beautifully finished at the expense of great labour, and are sometimes thickly covered with white shells (*Ovula oviformis*). Any aperture inside not filled with the sinnet is tightly caulked with coconut-husk, and such as are next the water are flushed up with the white pitch or resin.

The lines of the two canoes forming the *drua* differ considerably. A long bow, slackly strung, would represent the longitudinal section of the outrigger, both ends of which finish in a circle less than the palm of the hand. The keel of the main canoe has not so much curve, and the ends differ. The small end is heart-shaped or circular, and several inches across; the large end is like a great wedge, presenting its sharp perpendicular edge to cut the water.

Such canoes seldom exceed 100 ft. in length. The following are the dimensions of the largest canoe I know; its name was "Rusa i vanua" ("Perished Inland"), signifying that it would be impossible to launch it: Extreme length, 118 ft.; length of deck, 50 ft.; width of deck, 24 ft.; length of mast, 68 ft.; length of yards, 90 ft.

The measurements of another *drua*, the "Lobi ki Tonga," are as follows: Length, 99 ft. 3 in.; length of deck, 46 ft. 4 in.; width of deck, 20 ft. 3 in.; height from keel to house-top, 14 ft.; draught of water, 2 ft. 6 in.; length of mast, 62 ft. 3 in.; length of yards, 83 ft.

A good canoe in good condition makes very little water, and such as have been just described would safely convey a hundred persons, and several tons of goods, over a thousand miles of ocean.

A queer thing, called *ulatoka*—a raised platform on two logs—and a catamaran made of bamboos, are used in the bays and rivers.

The well-built and excellently-designed canoes of the Fijians were for a long time superior to those of any other islanders in the Pacific. Their neighbours, the Friendly-Islanders, are more finished carpenters and bolder sailors, and used to build large canoes, but not equal to those of Fiji. Though considering the Fijians as their inferiors, yet the Tongans have adopted their canoes and imitate them even in the make of their sails. This change was in process when Captain Cook first visited Tonga in 1772. The Fijians whom he saw there were probably the companions of Tui Hala Fatai, who had returned, a short time before, from Fiji in a canoe built by the people there, leaving in its place his own clumsy and hardly manageable *togiaki*. A glance at the new canoe convinced the shrewd chiefs of Tonga that their own naval architecture was sadly at fault. Their *togiaki*, with its square, upright mast, the spars for stays, projecting like monster horns, the bevelled deck, the loose house, and its broad, flat ends, contrasted with the smart Fijian craft much as a coal-barge with a clipper yacht. The *togiaki* was forthwith doomed to disuse, and is now seen no more among the fair isles of Tonga. Not the slightest change has been made in the model thus adopted, and which has now been used for more than a century by the best seamen in these regions; but the Tongans have the praise of executing the several parts with superior care and finish.

The following remarks are extracts from a paper on "Native Navigation in the Pacific," by Coleman Wall, read before the Fijian Society, 10th October, 1909:—

The writer states that the double canoe is still in use in southern Japan, and speaks of a Melanesian element at Penrhyn Island (Tongareva). He remarks that the surface currents of the Pacific vary considerably with the wind, generally setting to the eastward

just before westerly winds, and often north of the Equator the main current seems to recoil to the east. The Pacific currents have, as a rule, but little force. Wilkes could find none between Tahiti and Samoa, and speaking generally they could never much affect canoe navigation. Nor would the winds have much effect on canoes built so as to sail closer to the wind than any other craft designed by man. Though the general trend of the winds within the tropics is easterly, yet they can never be depended on. North and south winds are not uncommon at times, and the strong west and south-west winds from below the tropics sometimes blow home to the Equator. North-west monsoon winds from the Indian Ocean blow always to New Guinea, often as far as Rotuma, and have been felt as far east as the Marquesas. Probably the highest development of Oceanica is the *proa* of the Ke-Islanders, near Timor. They are built of planks which, unlike those of the canoe, are fastened together by wooden pegs, but the whole planking is then fastened to the frame by rattans. Vessels of 10 tons burden are thus built, making voyages of over two thousand miles to Singapore with perfect safety. Their smaller boats, which have high ornamental ends, are elegantly shaped, and swift under oars or sail. The famous "flying *proa*" of the Mariana Islands was built like the former, but with the lee outside flat to act as a centreboard (leeboard), and supplied with an outrigger, thus connecting the *proa* with the canoe proper.

"In general, all through Micronesia, the canoes were made of coconut boards neatly sewn together, and fastened to well-finished frames. The Papuan, when unmixed with other races, does not seem to have ever been much in favour of sails, but in the Solomons their pulling [? paddling] canoes, often capable of containing a hundred men, are models of symmetry and workmanship. When in the 'John Hunt,' running about seven knots an hour, I have seen a canoe paddle abreast of us for some miles without effort, and seemingly in no way inconvenienced by a nasty cross-sea. . . . In the New Hebrides, except at Aoba, perhaps canoe-construction is at the lowest ebb, but they use outriggers and sometimes a sail of calico. We now come to Fiji; and from Fiji to Easter Island, from Hawaii to Auckland, the favourite vessel was the great double canoe or *drua* of the Fijians, built of planks and sewn together, and capable of making rapid passages in anything less than a hurricane. Though similar in many respects, there were some differences due to local causes. In Fiji and Tonga the lower part of the hull was mostly carved from a single tree, but in islands less favoured with timber the keel-piece was formed of *damanu* planks 12 in. to 16 in. broad and about 2 in. thick, rounded on the outside, and lashed together when the requisite length was formed. The upper works were in all cases of planks so beautifully fitted as hardly to need the caulking of a thin strip of fibre. In Tonga and Fiji only one mast was used, while in the Low Archipelago they used two masts, one in each canoe. These canoes could sail up to twelve miles an hour, and beat about four miles an hour to windward. They were steered with two and sometimes three paddles, the great steer-oar serving as a centreboard, and by its aid also they were hove-to in heavy weather, and were fairly dry and easy. I only saw a sail reefed once, when crossing from Kandavu in the tail of a hurricane. It was done by casting the tack of the sail adrift and hoisting it as a bag to run under. I doubt if they ever reef a sail to lie close to the wind. How did they navigate? Partly, no doubt, by the sun, partly by the stars, but partly also by that sixth sense which renders it impossible for the blackfellow to get lost in the Australian bush, or the Arab in the desert—a sense rarely possessed by civilized man unless he lives in close touch with nature."

The writer mentions a Tongan fleet of thirty canoes that sailed to Fiji in 1855, where it joined Thakombau's fleet of 113 canoes at Bau. The whole force then attacked and took Kaba, raided up the Rewa River, and then went to Kandavu, after which the Tongan fleet returned home. "But it was the last spectacle of its kind that was ever to cross the Pacific. Kamehameha's great canoe was already rotting on the beach at Hawaii; the French were lords of Tahiti, the Marquesas, and Paumotus; within twenty years the

English flag was hoisted in Fiji. The days of the Vikings of the Pacific were numbered, and, quickly as they are vanishing, their wonderful vessels, and the skill to build and sail them, have vanished even more rapidly. While the Solomon canoe and Malay *proa* may still last for a time, I doubt if there is a double canoe afloat in the Pacific."

Early writers tell us that the Fijians constructed large double canoes capable of making prolonged sea voyages, but that the Fijians were no deep-sea sailors, and always endeavoured to secure the services of some Tongans when making the comparatively short voyage of about three hundred miles to the Tongan Group. The following passage from Erskine's *Journal of a Cruise among the Islands of the Western Pacific* tends to show that the building of large double canoes was not an ancient profession at Fiji: "The Tongans . . . from whom also they learned the art of building the large double canoes."

The Tongans adopted the Fijian type of canoe, and are said to have been neater builders in this line than the Fijians. Williams, in his *Fiji and the Fijians*, wrote: "I never heard of but one Fijian chief who had attempted to steer his canoe to Tonga." He also remarks that Fijians do not make bold sailors.

Of Fijian canoes as seen in 1849 Captain Erskine, of H.M.S. "Havannah," has given us the following notes: "The canoe was a small one of the ordinary construction, with an outrigger, &c., and was put about by shifting the tack of the sail to the opposite extremity, as described among the Tongans. One of the principal employments, which has now been entirely transferred from Tonga to Fiji, on account of the exhaustion of the building-materials in the one place and the profusion in the other, is the construction of large double canoes. . . . The Tongans are considered better sailors than the Fijians, but the latter are said to be fast improving, the art of beating to windward, and of reefing or reducing the sails to suit the force of the wind, being now understood, which was not formerly the case. They have no fast paddling-canoes like the Tahitians and Samoans, their mode of propulsion being slow and awkward, performed as it is by one or two large sculls pushed by men in a standing posture, the steering being effected by a large paddle over the quarter of the vessel."

This writer quotes a remark made by Lieutenant Pollard, of H.M.S. "Bramble," concerning some Fijian canoes seen by him in 1850: "These canoes are double, and about eighty feet long, carrying about one hundred and fifty men each." Another large double canoe is mentioned that was "at least one hundred feet long, and sufficiently large to carry three hundred men. Formerly they used, in performing their voyages to any distance, such as Hapai or Tonga, to dowse everything at the approach of a strong head breeze, and scud before the wind back again to whence they came."

Canoes of the New Hebrides Group.

Forster speaks of canoes of the New Hebrides as being small (not exceeding 20 ft. in length), of indifferent workmanship, and without ornament, but provided with an outrigger. Those seen at the island of Tanna, however, seem to have been larger; he describes them as follows: "Their form resembled that of the canoes at the Friendly Islands, but with this difference, that the workmanship was very inferior at Tanna. They have outriggers to all their canoes, and some may contain twenty people. Their sails were low triangular mats, of which the broadest part is uppermost, and the sharp angle below. A long piece of timber, hollowed out in the middle, forms the bottom of the canoe, and upon this one or two planks are fixed, forming the two sides, by means of ropes of the coconut-fibres. These ropes are drawn through the round holes in several knobs on the insides of the planks, by which means the latter are not pierced with a single hole. Their oars are ill-shaped and very clumsily made."

This singular plan of leaving knobs on the inside, through which lashing-cords were passed, was probably allied to the method employed south of New Guinea, and referred to by Wallace.

Speaking of Melanesian canoes, the Rev. G. Brown, author of *Melanesians and Polynesians*, says: "The canoes generally used by the natives were dug out of soft wood, and had very wide outriggers attached to them. The paddles used were long and pointed. The position of the chief or the most important person in the canoe was in the middle, and not in the front as in Polynesia. Some of their canoes which were used for going long distances were built of soft thin planks sewn together on the inside, and the seams covered with a damp-resisting gum obtained from trees. These canoes were called *mon*, and had no sails."

"In *The Savage South Seas* we are told that the largest canoes are made in Malekula, from whence the natives go long voyages to trade with other islands: "The poles supporting the outrigger are run through holes in the side of the canoe, and lashed into position. . . . On Rano, a little island near Malekula, are three or four very fine specimens of large war-canoes lying on the beach. I mention this, as it has been said by many writers who have visited these parts that the New Hebrides natives never possessed large canoes, whereas these are far larger than any in the Solomons. . . . The larger is considerably over thirty feet from stem to stern, and the bow rises up to a height of over ten feet." An illustration shows part of one of these canoes. Its sides are built up of planks lashed together. The mode of attaching the float to the booms is peculiar: the end of the boom being placed on the float, a number of wooden pegs are driven into or inserted in the float on both sides of the boom, and inclined over it so as to enclose it. This method of securing the boom to the float is a remarkably primitive one, and bears a clumsy appearance. The various modes of attaching floats to booms throughout the Oceanic area, and their distribution, is one of some interest.

A small type of New Hebrides canoe depicted in the above work show rude dugouts resembling the disinterred Henley canoe in the Dominion Museum, with inward-trending sides and two outrigger booms lashed to both gunwales.

Canoes of Santa Cruz Group.

Mendana saw double canoes at the Santa Cruz Group in 1595. Mr. Seed's report also states that these natives formerly employed large seagoing double canoes. Mendana remarked that the natives of Santa Cruz possessed "large handsome canoes, capable of carrying above thirty persons with their luggage, in which they navigated to distant parts. The sail was of matting, wide at the upper part and narrow below. They sailed swiftly, and turned well to windward."

Labillardière wrote as follows of the canoes of the Santa Cruz Group, seen by him in 1793: "All these canoes have outriggers. . . . Their bows are placed upon the platform situated between the canoe and the outrigger and formed of close wickerwork. The body of the canoes is in general fifteen feet long and six in width. It is of a single piece cut out of the trunk of a tree, very light. . . . There is through the whole length an excavation of five inches wide. Here the rowers sit with their legs one before the other, and up to the calf in the hollow [see fig. 163, p. 254]. They are seated on the upper part, which is smooth. At each of the extremities, which are formed like a heart, we observed two T's, the one above the other, cut out, but not very deep, and sometimes *in rilievo*. The lower part of the canoe is very well formed for moving through the water. The outrigger is always on the left of the rowers."

Seventy-four of these canoes were seen in one bay. The body of a canoe 15 ft. in length would certainly not be 6 ft. in width. This must include the outrigger.

Of the canoes of this group W. Coote remarks, in his little work on the Western Pacific: "The canoes of this group are as distinctive in character as the people

themselves. They are almost always *built*—that is, are not carved out of a single log, as is usual in the canoes of less ingenious races. They are, however, stained white, and, in addition to the usual outrigger, have a counterbalancing platform on the other side, on which may be carried bundles of arrows, coconuts, breadfruit, and other necessaries. Their dexterity in the management of these canoes is most remarkable. We saw several of them upset and swamped, but the owners, swimming up to them, would, in less time than it takes to write of it, shake the water out with a swinging motion, jump in, and bail them dry with the greatest ease. . . . Drawn up on this beach were some splendid canoes, fitted with spars and sails, and reserved for long journeys. They were over forty feet long, and were decked in, so that such cargo as they might carry could be battened down and kept from wet. Upon the platform between the main hull and the outrigger was a small house in which a fire could be lighted. The sail, which was of matting, was

[*Beattie, Hobart, photo.*

FIG. 163.—OUTRIGGER CANOES OF SANTA CRUZ ISLANDS.

Small craft with narrow hulls. (See p. 253.)

of the usual heart-shape, with a semi-circle cut away from the top. These vessels will not sail near the wind, but attain a very fair speed when running free."

Here we meet with the balance-platform of Micronesia, fixed on the opposite side to the outrigger, and also the Tahitian form of sail. A photograph of a trading-canoe of Santa Cruz shows the arrowhead sail with deep opening, resembling those of New Guinea. The canoe carries an outrigger on one side, a balance-platform on the other.

D'Urville gives us an illustration of a canoe of Vanikoro (Queen Charlotte Islands, north of New Hebrides) showing the arrowhead form of sail. It is rigged as a lateen sail with two yards, set at a high angle, while the mast is set obliquely at a low angle. The effect of this is most singular. Another shows a canoe of the same locality with outrigger on one side and balance-platform on the other. Another platform appears on the booms

of the outrigger, and both of these platforms slope upwards and outwards. The sail has a very deep, rounded indentation in its upper part. The hold of the vessel is narrow. Yet another illustration of a Vanikoro canoe shows the hold decked over with the exception of a comparatively small central portion. The crew or passengers must occupy the two platforms. The two booms are connected with the float by short pieces, while two braces or struts extend from either side of the boom platform to the float.

Canoes of New Caledonia.

Forster's remarks on the double canoes of New Caledonia are as follows: "We were surrounded by about twenty canoes, each of which was provided with sails, and consisted of two hulls, connected by a platform of boards, on which lay a heap of soil and ashes, where the natives kept a constant fire. . . . They had fires upon every canoe, having laid some stones and ashes on the platform to prevent any accident."

Labillardière wrote in 1793: "The savages came in double canoes. . . . Their mast was fixed at an equal distance from the two canoes, and towards the fore part of the

[*Beattie, Hobart, photo.*

FIG. 164.—A SAILING OUTRIGGER CANOE OF REEF ISLANDS, MELANESIA.

Shows balance-platform and cabin.

platform by which they were joined together. They are not so skilfully constructed as those of the Friendly Islands, to which they are much inferior in the point of sailing."

Mr. John F. G. Stokes, of Honolulu, tells us in volume 1 of *Occasional Papers of the Bishop Museum* that Chinese and Japanese sails were trapezoidal and square sails; those of Formosa and the Liu Kiu Islands resemble Chinese sails, as also did those of the Philippines. The sails of the Malayan Archipelago are rectangular or rhomboidal; these are found as far eastward as New Guinea, though modified at various places. Eastward of New Guinea another form appears. "The shape of this," says Mr. Stokes, "may be said to have resembled an attenuated arrow-head with the haft removed and the tips of the thin barbs contracted. The sail was provided with a sprit and a boom of equal length, the sprit being about twice the height of the mast, and having the lower end stepped in a chock on the deck near the foot of the mast. The sailing-canoes were double, and sometimes treble, and carried two or more sails. The shape of this sail held with little variation among the islands to the eastward almost as far as Fiji, and then became merged into the triangular sail of the Fijians. . . . The New Caledonian sails were simply described as triangular. . . . To the north and north-west of Fiji, among the

[*Beattie, Hobart, photo.*

FIG. 164A.—OUTRIGGER OF REEF ISLANDS.

A more elaborate structure than outriggers of Polynesia. The shed, balance-platform, with substructure, are clearly shown.

[*Beattie, Hobart, photo.*

FIG. 164B.—SMALL OUTRIGGER OF REEF-ISLANDERS.

Gilbert Islands, Micronesia, and the Marianas, the sails were more of the lateen type than any others in the Pacific, but differed from the lateen in having, besides a sprit or yard, a boom of almost equal length. . . . These vessels sailed close to the wind, and were shaped bow and stern alike . . . the outrigger was always kept to windward of the hull when sailing, for if to leeward the weight of the wind might easily force it under water, and a capsize would promptly ensue."

The "arrow-head" sail described above may have been the prototype of the "half-moon" Tahitian sail, and of the Hawaiian form. It is certainly allied to the Santa Cruz form.

The later researches of Mr. Hornell show that the triangular sail of Polynesia is used in certain parts of Indonesia.

Missionary Turner wrote as follows of canoe-making at New Caledonia: "They felled their trees by a slow fire close to the ground; took four days to it. Burned off the

[*Beattie, Hobart, photo*

FIG. 165.—A MUCH-ADORNED CANOE OF THE SOLOMON GROUP.

In this region are used canoes of the single outriggerless type, as found in New Zealand.

branches also, and, if for a canoe or house post, the length of log required. If for a canoe, they cut a hole in the surface of the log, kindled a small fire, and burned down and along to confine the fire to a given spot; and in this way they hollowed out their logs for the largest canoes."

Canoes of the Solomon Isles.

Canoes of the Solomon Isles seen in 1753 are described by Labillardière, of the d'Entrecasteaux Expedition in search of La Perouse: "We admired the elegant form of their canoes . . . they were about twenty-one feet in length, two feet in breadth, and fifteen inches in depth. The bottom consisted of a single piece cut from the trunk of a tree, and the sides were formed of a plank the whole length of the boat, supported by beams fixed at equal distances into the bottom: at both ends other planks were

attached to the first. These were ornamented on the outside with figures of birds, fishes, &c., rudely carved. The greater part of the canoes were terminated in front with the head of a bird, under which was seen a large bunch of fringe, coloured with a red dye."

Of one of these vessels being put to its best speed under the paddle he says: "We were amazed to see their canoe skim the waves with such rapidity that it must have run at the rate of at least 7,500 *toises* an hour." This would represent a speed of about nine miles an hour. Here we have the continuous top-strake and, apparently, some form of rib.

W. Coote, in his work *The Western Pacific*, writes: "Perhaps the Solomon Islands are more celebrated for their canoes than for anything else, and, if so, I think, with reason. . . . They are made of bent planks of wood held together with strong thwarts, and

[*Beattie, Hobart, photo.*

FIG. 166.—CANOE OF SOLOMON GROUP.

cemented with a kind of gum obtained from a tree. The stern is always carried up to a considerable height, like the bow of a gondola, and in large canoes both bow and stern are of the same graceful shape. They are narrow, and have no outrigger, but sit on the water literally 'like a duck.' . . . There is a large amount of inlaying, the designs being quaint and conventional, but certainly not without merit. I suppose these canoes are the most crank craft in the world, yet the natives can take them out in fairly rough weather, and always manage them wonderfully. . . . The work expended on some of the more magnificent ones surprised me very much, in some cases there being many thousands of pieces of pearl-shell, all carefully shaped and let in in accordance with an elaborate design."

Now, for the first time, we encounter elsewhere the New Zealand form of canoe, the single canoe with no outrigger. The elevated prow and stern also similate the *waka maori*.

In Seed's report on the Pacific-islanders occurs the following. Of Solomon-Islanders he says: "Their canoes are exceedingly graceful and light, and without the outriggers common to all others. They also possess large war-canoes carrying from thirty to sixty men, and in these they traverse great distances, sometimes beyond the sight of land."

An illustration in *The Savage South Seas*, by Norman H. Hardy and C. Way Elkington, shows a number of war-canoes of the Solomon Islands with very high prows and sterns, decorated with feathers and inlaid shells. They carry eighteen or twenty paddlers each. A canoe-shed to shelter such vessels was found to be 72 ft. in length and 30 ft. wide. The paddles depicted have a short blade and a crescent-shaped projection on the end of the handle.

A photograph of a small outrigger fishing-canoe of the Solomon Isles shows the float as long as the hull, and connected therewith by means of four straight booms, the outer

[*Beattie, Hobart, photo.*

Fig. 167.—Small Outriggerless Canoes of Ulawa, Solomon Group.

ends of which are connected with the float by means of two sticks secured in a vertical position, one on either side of the boom. This craft lacks the high prow and stern of the big canoes. If correctly assigned, then both forms of craft must be employed at the Solomon Group.

Canoes of New Ireland.

During Carteret's voyage in 1767 an outrigger canoe about 90 ft. long was seen at New Ireland, and it is said to have been formed of a single tree. The latter statement is perhaps not correct; the joining of a *haumi* might well escape any but the closest scrutiny, so neatly was it performed.

In describing the natives of New Ireland, Captain Morrell, who visited that place in 1830, says: "Their canoes are from eighty to ninety feet in length, and carrying from seventy to eighty men each. These are their war-canoes; they have smaller ones for

fishing and other ordinary purposes. All of them are fitted with outriggers. . . . Their war-canoes are very swift, but they seldom use sails."

A canoe of New Ireland shown in *The Voyage of the "Astrolabe"* has an outrigger practically the same length as the canoe, with which it is connected by no fewer than nine booms. The ends of this canoe are much elevated.

Canoes of New Guinea.

In the account of the voyage of the "Astrolabe" we have an illustration of a New Guinea canoe with double outrigger, apparently. This was seen at Port Dorey. Both ends of the vessel are much elevated. Another such is shown fitted with a tripod mast on which is slung an interesting form of sail. This sail is oblong and rectangular, showing an easterly extension of a Celebes form. Advancing farther eastward in the Pacific we lose the rectangular form of sail. The above sail is provided with two yards, and is not hoisted in a horizontal position, but diagonally, as a lateen sail is. It looks as though this form had been adopted by a people who formerly used the triangular lateen sail, and who persisted in setting it in a similar manner. The triangular sail seems to have been the form originally employed over at least the greater part of the Pacific area, while the rectangular form had been carried eastward from Asia as far as New Guinea. The same authority shows a sail of similar form, oblong and rectangular, and set in the same oblique position, on a canoe of Amboyna, but in this case supported by a single mast, not the tripod structure. D'Urville gives an illustration of the double balance-platform of Amboyna.

In his work on British New Guinea J. P. Thomson states that, on a river running into Heath Bay, canoes having no outrigger are used by the natives. "These canoes, which measured about twenty feet in length, eighteen inches in breadth, and probably fifteen inches in depth, possessed no outriggers. They had been constructed of a hard dark wood dug out by the stone adze; their ends, which bore no ornamentations of any kinds, were alike in shape. Paddles are not used as the motive power, the method of propulsion being by means of poles." Later on he remarks: "It was noticed that they moved about in canoes without outriggers, which they propelled by means of long poles that were used as paddles in deep water and for poling purposes in the shallows."

Of canoes seen at Collingwood Bay, British New Guinea, J. P. Thomson wrote: "They possess some large canoes, of about forty feet in length and two and a half feet wide, sharp at the ends, and made from single logs of wood. They are balanced by outriggers projecting about twelve feet from their sides, the intermediate space being occupied by platforms constructed upon the crossbars."

Chalmers mentions having seen a few canoes without outriggers in use on the coast of the Gulf of Papua. Of a sojourn at Maipua he writes: "By the sides of all the small streams are to be seen beautifully-cut-out canoes. Many are very fancifully carved, but none of them have outriggers. On these the Maipuans do all their fighting, and for days travel up the river," &c. Apparently these single canoes with no outriggers were used as river craft and for inshore work.

In *The Savage South Seas*, by Hardy and Elkington, is an illustration of a double canoe of New Guinea carrying a big lateen sail with two yards. This sail is of the arrow-head form, and the sides are curved, not straight; the opening at the top is a deep one. Such vessels consist of two or three large canoes lashed together and boarded over. These natives still prefer the stone adze in such work as finishing off a canoe.

In his well-illustrated work, *Picturesque New Guinea*, J. W. Lindt remarks that the Motu natives of eastern New Guinea make trading voyages along the coast to dispose of their pottery to the tribes of that region: "We saw them fitting up their large trading-canoes, or *lakatoi*, as they call them, which are in fact a species of raft formed of five or more large trunks of the buoyant pencil-cedar tree, hollowed out and lashed skilfully together. These huge rafts were in various stages of completion; from twenty to forty

busy workmen were in each, fixing the lashings, and making splash-boards of lengths of thatch composed of pandanus-leaves. . . . A framework of strong saplings is first lashed right across the huge trading-vessel, projecting fore and aft about eight feet, and three feet over the sides, forming, when covered with the leaves, a gangway all round. Huts of the same tough material are erected on this base, and last of all the mast is shipped, carrying a neat sail of a peculiar shape, like the claw of a crab [the arrow-head sail]. Of course, naval structures of this kind are not well calculated for sailing close to the wind, but the astute natives get the better of Neptune and his laws by taking advantage of the prevailing winds to make their voyages annually. With the last of the south-east trades they sail westward to the villages on the coast . . . and after several weeks . . . they catch the north-west monsoons to return homewards. Sometimes, on the return voyage, half a dozen or more of the family trading-canoes are lashed together, thus forming quite a floating village."

Of a canoe seen near South Cape, New Guinea, the same writer remarks: "On our walk to the beach we noticed a large war-canoe, made of an immense log of very buoyant timber, with the sides regularly built up of large planks of the same wood. The stern and stem were rudely ornamented with carvings, and painted with red, white, and black pigment, the only three colours in use among them. On one side of the canoe a log was attached as an outrigger, enabling the craft to live in a pretty heavy sea."

Concerning canoes seen at Rook Island, between the coast of New Guinea and New Britain, the Rev. James Chalmers wrote as follows: "We had many very fine canoes alongside. They are made something like those of Teste Island: a tree is dug out and then built on, only the upper sides are beautifully carved. They had two masts stepped like a V, with small mat sails. The outrigger was very large, and well away from the canoe. There was a platform in the centre, on which all the people sat, except those immediately required to steer. They sail well, and work splendidly to windward."

The same writer speaks of as many as fourteen or fifteen canoes being fastened together in returning from these trading voyages along the New Guinea coast. These raft-like craft, he remarks, are very cumbersome: "In rough weather they labour fearfully, and often they have to cut away all but two, in which they save their lives; sometimes they are never heard of."

Of a trading-craft of New Guinea F. Burnett wrote: "It consisted of three canoes, held firmly together by a bamboo platform, upon which was erected a large-sized house. Its length must have been at least forty feet, and yet I was informed that this was not considered a large specimen of its type. . . . They are strongly constructed crafts, well fitted, therefore . . . to make the long trading voyages for which they are used. Some of the larger ones, I am informed, accommodate as many as fifty men and women, besides children. These canoes are built by a tribe dwelling on the southern coast of New Guinea, for the purpose of enabling them to distribute the pottery they manufacture."

Canoes of Admiralty Isles.

Labillardière makes the following remarks on canoes of the Admiralty Isles, near New Guinea, as seen by him in 1792:—

"Their canoes are formed of the excavated trunk of a tree, with boards fitted to its sides. Their length is thirty-two feet, and their extreme breadth not more than twenty-six inches. Their sides are supported internally by cross-boards, which form so-many divisions, in the bottoms of which are the paddlers, towards the two extremities of the canoe. Those canoes are furnished with an outrigger, about thirteen feet in length, which projects laterally, and nearly at the same distance. On the opposite side is a counter-outrigger, which does not take the water, and which is eight feet in length. It serves as a place upon which to lay the sail; the commander sometimes sits upon it, but his station is commonly on an elevated platform of the same extent as the outrigger.

"The sail is a mat, in the form of a regular square, thirteen feet in the side. Two opposite sides of it are fastened to poles of the same length, which serve for yards. When the sail is set, one of its diagonals is always vertical, and its upper angle is elevated three feet above the top of the mast, which is about twenty feet in height. The wind acts strongly upon so lofty a sail, and gives to those canoes an impulse which makes them plough the water with astonishing rapidity. When this swift motion is not required, they only hoist about five feet of one side of their sail in a horizontal position, while the rest of it lies on the canoe. But in this way they can only sail right before the wind.

"Their paddles are very broad, and are furnished with a handle six feet and a half in length. They use them as our sailors do their oars; for they act like levers, whose point of support is on one side of the canoe. The steersman is stationed in the stern, and directs the canoe with his paddle."

Here again is the balance platform opposite the outrigger, but the triangular sail is replaced by a square one. The mode of using the paddles is by no means clearly put.

Of some of these canoes accompanying the vessel this writer says: "We admired the celerity with which the flotilla clave the waters. Although we had a very fresh breeze, and a great deal of sail set, those little vessels sailed a great deal faster than our ships."

The canoes of the Hermit Isles, west of the Admiralty Group, were found to be similar to those above described, but not such good sailers. They had two sails, the after one much smaller than the forward one; they were both rectangular, the length being almost double the breadth.

Micronesian Canoes.

The canoes of the Micronesians, states Hale, resemble, in model, construction, and rig, those of the Fijians, and are like a long, narrow boat. They sail very near the wind, and move with great rapidity. The largest seen are at Makin, which are not less than 60 ft. in length, and 6 ft. in width. The canoes of the Mulgrave Islands have one side flattened. This latter form is a Malay Archipelago type, the *proa* or *prau*.

Canoes of Caroline Islands.

Morrell, who cruised among the Caroline Islands in 1830, speaks as follows of the canoes of the natives:—

The canoes of these natives are mostly of great length, carrying from fifteen to thirty men. The bottom is of one log, generally from thirty to fifty feet in length, and got out [hewn out] in the form of a canoe. . . . On this foundation they proceed to build the vessel. Each side is formed of a single plank, from fourteen to eighteen inches in width, making the depth of the boat; but the two sides are not alike, one being nearly flat and straight next the water, and the other somewhat bulging. These sides are sewed fast to the bottom with a strong cord made from the bark of a tree, and also to a beautifully carved head and stern, resembling those of the ancient galleys which we often meet with in classical paintings.

As these canoes are frequently propelled by sails, and as the bulging side is always to windward, the reader will naturally suppose that it could not long retain an upright position, but would be liable to be upset. This is prevented, however, by a very ingenious contrivance. A frame, called an outrigger, projects out eight or ten feet horizontally from the rounded, bulging, or windward side, at the extreme end of which is attached a piece of buoyant wood, shaped something like a canoe. The weight of this apparatus prevents the boats capsizing to leeward, while that side being flat prevents her making leeway. At the same time the buoyancy of the outrigger and bamboo frame renders it impossible for her to overset to windward. This is the form and construction of their single canoes, which go through the water with great velocity, whether propelled by paddles or sails, or both.

Their double canoes are formed in the same manner as the one just described, with the exception of the outrigger, which, of course, is not necessary. Two canoes are fastened together abreast of each other, with bamboos extended across them, on the same principle of construction as our twin ferry-steamboats. These canoes are generally about forty feet in length, and the distance between them

is from eight to ten feet. The bamboos which unite them are placed about two feet apart, and strongly secured to the gunnels by a lashing of their bark cord. Small sticks of bamboo are then extended fore and aft, secured to the cross-pieces, thus forming a light platform from twenty to twenty-five feet in length, and eight or ten feet wide. They paddle on the two outsides and insides of the canoes, propelling them forward with astonishing speed, much swifter than our whaleboats with six oars pulled by our most vigorous tars. These are called war-canoes, and many of them have very curiously carved heads and sterns, which rise from one to three feet above the hull, not unlike the fashion of the New-Zealanders. Their paddles are generally four feet in length, with blades about six inches wide, the whole very neatly finished off with carved work, admirably executed.

Their sails for the single canoes are made, like their own garments, of a beautiful long grass, which they have the art of weaving into a strong substantial cloth. These sails are shaped like what is called a 'shoulder of mutton,' and used in the following manner: The mast stands exactly perpendicular in the centre of the canoe, being from twelve to eighteen feet in height. At the head of this mast is hoisted a yard, proportioned to the size of the canoe, from twenty-five to thirty-five feet in length. The sail spreads this yard, and when hoisted at the masthead its foot sweeps the gunnel of the canoe. These sails are set in such a manner that the canoes never need go in stays when beating to windward, being so constructed as to go either end foremost. When they wish to go on the other tack, she suddenly falls off until the other end of the boat becomes the head, and luffs up to the wind; by which time the men have raised the tack on the depressed end of the yard, and brought its opposite extremity down to the other end of the boat. Thus she hugs the wind on either side by turns, without ever looking directly in its teeth.

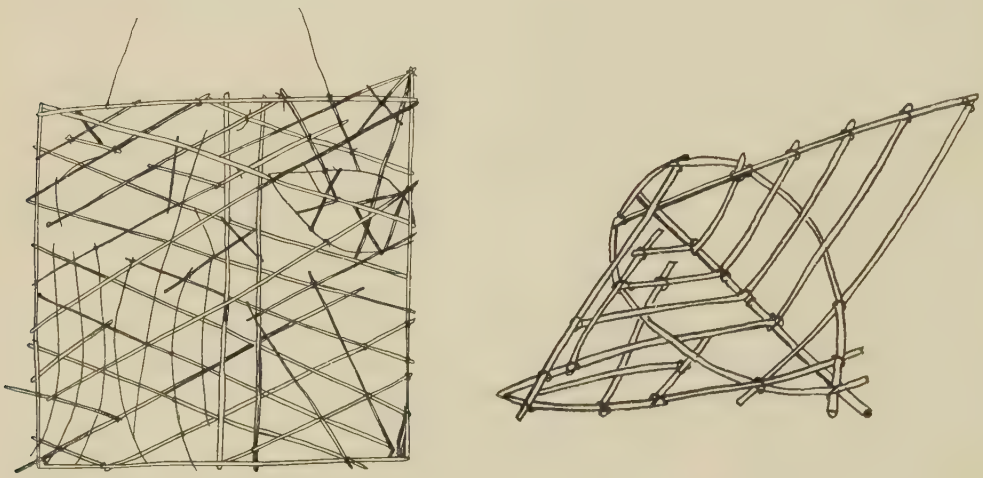
I have seen these boats going at the rate of eight miles an hour, within four points of the wind. But let them run large, or before the wind, with a strong breeze, and I have no doubt but they will go at the rate of twelve or thirteen miles an hour in smooth water. By only shifting the sail, with a side wind, these canoes will pass, back and forth, between two islands, each end alternately foremost, with great rapidity, without the necessity of putting about. The sails are made in small pieces of about three feet square, sewed together. In cutting the sail to its proper shape, the pieces which come off one side answer to go on the other; this gives it the proper form, and causes the halliards to be bent on in the middle of the yard.

These hewn-out hulls with single wide top-strakes sewn on, and carved head and stern pieces, remind us of New Zealand craft. The straight side to leeward acted as a lee-board: this is seen in the Indian Archipelago, but no such form is reported from Polynesia. It appears at the Gilbert Group. The sail appears to be that of the Fijian and Tongan Groups. Morrell does not mention the balance-platform in his account.

Arago tells us that no native of the Caroline Islands is allowed to marry until he has given proof of his dexterity in steering a *proa*: "For this examination a time is chosen when the sea is rather high. The candidate is placed at the sheet (for they steer their vessels entirely by the sails), and there, surrounded by reefs, and in the midst of foaming waves, he must make his *proa* sail a certain distance without allowing its balancer to touch the waves. I could not have believed that they possessed so much skill if I had not sailed in their vessels."

Dampier describes a form of *proa* seen by him at Mindanao, Philippine Isles, with what he calls an "outlayer" on each side. These were not true outriggers, but two projecting balance-platforms, one on either side, neither of which touched the water when the craft was on an even keel. "The boat is not flat on one side here, as at Guam; but hath a Belly and Outlayers on each side; and whereas at Guam there is a little Boat fastened to the Outlayers, that lies in the Water, the Beams or Bamboos here are fastened traverse-wise to the Outlayers on each side, and touch not the Water like Boats, but one, three, or four foot above the Water, and serve for the Bargemen to sit and row and paddle on; the inside of the Vessel, except only just afore and abaft, being taken up with the apartments for the passengers. There run across the Outlayers two tire of Beams for the Paddlers to sit on, on each side of the Vessel. The lower tire of these Beams is not above a foot from the Water; so that, upon any reeling of the Vessel, the Beams are dipt in the Water, and the men that sit are wet up to their waste; their feet seldom escaping the water. And thus, as all our Vessels are Rowed from within, these are Paddled from without"

D'Urville's illustrations of canoes of the Caroline Group show a comparatively short outrigger, with a balance-platform on the opposite side. There is also a platform on the booms of a triangular form, which is formed by covering with rods not only the space between the two booms, but also the spaces between the booms and the two side braces or struts, which resemble those of the Vanikoro canoe. There appears to be a roofed cabin on each of the platforms. The ends of the canoe are much elevated. The sail is of the lateen form, with two yards, and the mast nearly upright; the paddle depicted resembles the Maori form. The hold is open throughout its length, except at the middle. Another canoe, of a larger type, shows a narrow hull, long booms on which several longitudinal spars are lashed, and on these, immediately over the booms, other poles are lashed, apparently to strengthen the structure. The balance-platform, like those of Vanikoro, is not horizontal but tilted upwards. The latter carries an awning-like roof, and the boom platform a thatched cabin. The paddle shown is not of Maori form; it may be a steer-oar.



[*Sketch by Miss E. Richardson.*

FIG. 167A.—STICK CHARTS FROM THE MARSHALL ISLANDS.

We are told that by means of sticks, strings, and small pieces of wood the ocean currents, wave-trend, and islands were represented. Godeffroy Collection, Hamburg.

Canoes of the Ladrones.

The swift *proa* or canoes of the Ladrones were described by Dampier as seen by him in 1686:—

The natives are very ingenious beyond any people in making Boats, or *Proes*, as they are called in the East Indies, and therein they take great delight. These are built sharp at both ends; the bottom is of one piece, made like the bottom of a little Canoa [canoe], very neatly dug, and left of a good substance. This bottom part is instead of a keel. It is about twenty-six or twenty-eight foot long; the under part of this keel is made round, but inclining to a wedge and smooth, and the upper part is almost flat, having a very gentle hollow, and is about a foot broad. From hence both sides of the Boat are carried up to about five foot high with narrow plank, not about four or five inches broad, and each end of the Boat turns up round, very prettily. But what is very singular, one side of the Boat is made perpendicular, like a Wall, while the other side is rounding, made as other Vessels are, with a pretty full belly. Just in the middle it is about four or five foot broad aloft, or more, according to the length of the Boat. The Mast stands exactly in the middle, with a long Yard that peeps up and down like a Mizen-yard. One end of it reacheth down to the end or head of the Boat, where it is placed in a notch that is made there purposely to receive it and keep it fast. The other end hangs over the stern. To this yard the sail is fastened. At the foot of the sail there is another small yard, to keep the sail out square, and to roll up the sail on when

it blows hard: for it serves instead of a reef to take up the sail to what degree they please, according to the strength of the Wind. Along the belly-side of the Boat, parallel with it, at about six or seven foot distance, lies another small Boat, or Canoa, being a Log of very light Wood, almost as long as the great Boat, but not so wide, being not above a foot and an half wide at the upper part, and very sharp like a wedge at each end. And there are two Bamboos of about eight or ten foot long, and as big as one's Leg, placed over the great Boats side, one near each end of it, and reaching about six or seven foot from the side of the Boat, by the help of which the little Boat is made firm and contiguous to the other. . . . The use of them is to keep the great Boat upright from oversetting, because the Wind being in a manner constantly East, and the Range of these Islands, where their business lies to and fro, being mostly North and South, they turn the flat side of the Boat against the Wind upon which they sail, and the belly-side, consequently, with its little Boat, is upon the Lee, and the Vessel having a Head at each end, so as to sail with either of them foremost, indifferently, they need not tack, or go about, as all our Vessels do, but each end of the Boat serves either for head or stern as they please. When they ply to windward, and are minded to go about, he that steers bears away a little from the Wind, by which means the stern comes to the Wind, which is now become the head, only by shifting the end of the yard. This Boat is steered with a broad Paddle instead of a Rudder.

I have been the more particular in describing these Boats, because I do believe they sail the best of any Boats in the World. I did here for my own satisfaction try the swiftness of one of them; sailing by our Log, we had twelve knots on our reel, and she run it all out before the half-minute glass was half out; which, if it had been no more, is after the rate of twelve mile an hour; but I do believe she would have run twenty-four mile an hour.

The Native Indians are not less dexterous in managing than in building these Boats. By reports, they will go from hence to another of the Ladrones Islands, about thirty leagues off, and there do their business, and return again in less than twelve hours. I was told that one of these Boats was sent Express to Manila, which is above 400 leagues [about 480 leagues, says Burney], and performed the Voyage in four days' time.

There are of these *Proes*, or Boats, used in many places of the East Indies, but with a Belly, and a little Boat on each side.

According to the above writer, these Ladrone craft had their sides built up with a series of narrow planks, and not with one wide one. The practice of reducing sail in a high wind here described does not seem to have been known in Polynesia, where, as in New Zealand, a sail of the *ra kautu* type could only be used in its entirety. "They turn the flat side of the boat against the wind" seems to be a reversal of the usual mode, and is possibly an error. These are said to be the swiftest sailing-craft in the world.

In the account of Magellan's sojourn at the Ladrones in 1521 occurs the following remarks on canoes seen there: "Their canoes had lateen sails (in shape resembling a shoulder of mutton) and each had an outrigger—*i.e.*, a light boom or pole running in the water parallel to the canoe—with which it is connected, and preserved in its parallel position by transverse small poles securely fastened to each. The outrigger, by its weight and buoyancy, keeps steady the canoe, which, being a vessel of light and narrow construction, would, without such support, be in constant danger of oversetting. The canoes of these islanders were built alike at both ends, which enabled them to go with either foremost; and they sailed with great swiftness. They were variously and fancifully painted, and the largest that came off would not carry more than ten men."

Canoes of Guam illustrated in D'Urville's *Voyage* show an outrigger very nearly as long as the canoe, with which it is directly connected by means of two curved booms.

Canoes of Pelew Islands.

In his *Account of the Pelew Islands*, Captain H. Wilson writes as follows: "They were, like most other canoes, made from the trunk of a tree dubbed out, but our people, who had often seen vessels of this sort in many other countries, thought those of Pelew surpassed in neatness and beauty any they had ever met with elsewhere. . . . They were painted red both within and without, and inlaid with shells in different forms. When they went out in state, the heads and sterns were adorned with a variety of shells strung on a cord, and hung in festoons. The smallest vessel that they built could hold

four or five people, the largest were able to contain from twenty-five to thirty. They carried an outrigger, but only on one side, and used latine sails made of matting." This writer speaks of seeing a fleet of upwards of three hundred of these canoes, which "formed a most beautiful and splendid appearance."

Indonesian Canoes.

Canoes of Celebes.

Canoes of Celebes illustrated by D'Urville show a double outrigger form—two booms and floats attached by short curved pieces of timber. The sail is set or slung on the mast as is a triangular lateen sail, but is oblong and rectangular. Another illustration shows the two floats attached to the booms by means of two sticks, one curved, the other straight. Yet another shows curved booms connected directly with the floats. Mr. J. Hornell's researches give us a clear idea of the outrigger canoes of Indonesia.

Canoes of Borneo.

In his work on the natives of Sarawak and British North Borneo, H. Ling Roth gives some information about native boats. A carved figurehead of a Kayan war-canoe, partially perforated, shows the double scroll seen on the prow of the Maori war-canoe. A Dyak war *prau* shows a very lofty and ornate stern-piece, also a fighting-stage extending nearly the whole length of the vessel. These folk are said to usually paddle their craft about six miles an hour, but when exerting themselves can double that speed. A carved paddle depicted is of Maori form; two plain ones have blades of square form, and look clumsy with cross-pieces on the handle-ends. A Dyak dugout has a top-strake attached, also the Maori mode of bracing or strengthening by means of lashed-on thwarts instead of knees. The top-strake seems to be fixed clinker-fashion. Modes of building up sides, securing planks, steering, &c., differ considerably in Borneo, owing doubtless to race-mixture and foreign influences. Awnings or shelter roofs are often used. Some craft have elevated prow and stern, some show carved work on figurehead or stern-piece. Kayan canoes are seen as much as 38 yards in length and 7 ft. in beam; such a craft accommodates about a hundred paddlers, who sit two abreast. On the rivers a considerable amount of poling is done, the natives being remarkably expert with the pole.

Outrigger Canoes of Ceylon and India.

The author of *The Cruise of the "St. George"* gives us a brief account of outrigger canoes seen in 1891 at Ceylon, and which are also used on the coast of India. The hold of these canoes was but 15 in. across, reminding us of some Polynesian forms; in fact, this is just the inside measurements of a Manihiki canoe in the Dominion Museum; and another therein measures only 11 in. in width, inside measurement.

The above writer remarks: "These catamarans consist of a hollowed-out tree-stem, rounded up at both ends, with sides made of inch boarding sewed on with coconut-fibre cordage, for there is not a nail in the whole concern. As this would be too narrow to remain upright in the water itself, it is supported by an outrigger made of another log about half the length of the boat, and kept parallel to it, and about two yards off, by two pieces of bamboo, lashed fore and aft at right angles from one to the other. When the wind gets strong and threatens to overturn it, one or more of the men get upon the outrigger to weigh it down."

"In the India Museum," says Colonel Lane Fox, "there is a model of a very early form of vessel from Birmah [Burmah], described as a trading-vessel. The bottom is dug out, and the sides formed of planks laced together. A large stone is employed as an anchor."

Long, narrow vessels, made from a single tree, with both ends much elevated, and accommodating 150 rowers, were seen in Siam in 1771.

Polack compared the Maori canoe to the pirogue of Madagascar, which, he says, it resembles.

The canoes of Manipur, as shown in an old print, resemble Maori and Polynesian forms in the high prow and ornamental work at the stern showing scrolls. About fifty-six paddlers are shown. Another such print shows a canoe of Burmah, with high prow and stern, and about thirty-two paddlers; also a Siamese canoe, with high prow and stern, and a figurehead.

Of a small dugout canoe of the Andamans, C. B. Kloss writes: "Near the hut lay a nearly completed dugout canoe, about twenty-eight feet long by three feet wide and deep, of the usual Andamanese form, with sawed-off ends, and projecting platforms at bow and stern, forming convenient places to stand on when spearing turtle and fish. The sides were left about one inch and a half thick."

Of the canoes of Kar Nicobar the same authority writes: "These vessels, all dugouts, constructed from a single trunk, are very narrow in proportion to their length, and of graceful shape. After the canoe is hollowed it is somewhat spread out by cross-pieces of wood, which are lashed from gunwale to gunwale, at intervals of about a foot. To give the required stability an outrigger is attached. To two projecting spars lashed to the canoe, a log of very light wood, about three-quarters the length of the hull, and sharp at either end, is fastened, and the correct level of this float is maintained by each spar [boom] being bound to, and resting in, the angle made by three intersecting pairs of hardwood pegs, which are driven into the outrigger [float]. The vessels are further provided with ornamental projecting stem and stern pieces, carved in a variety of designs, and sometimes painted red. . . . The paddles are about four feet long, very light and thin . . . with lancet-shaped blades."

Of another canoe seen at the Nicobar Islands he writes: "A new and very large canoe was lying on the beach, the dugout portion, without additions, measuring forty-two feet long by three feet wide and three feet deep. The hull was charred, and decorated by grooved bands running at short intervals from gunwale to gunwale round the outside. Canoes are fitted, according to size, with from one to four short bamboo masts, each supported by four wide spreading stays of rattan, and on these are hoisted lateen sails with a short tack of about twelve inches, made of cotton or pandanus-leaves. The masts are never stepped on the floor of the canoe, but always on one of the crossbars or thwarts."

The charring of the outer surface of the hull was for protection from the effects of water, no paint being used. We have seen that the outer batten, covering the join of the top-strake, was sometimes charred by the Maori: this was to blacken it. An illustration of one of these Nicobar canoes afloat shows an upward-sloping stern-piece and prow, the latter terminating in two long points or prongs. Another illustration shows a similar design marked as a stern-piece. It has ornamental carved designs at the base of the two prongs.

Of canoes of Great Nicobar seen in 1688 Dampier remarked: "The canoes that they go fishing in are sharp at both ends, and both the sides and the bottom are very thin and smooth. They are shaped somewhat like the *praus* at Guam, with one side flattish and the other with a pretty big belly, and they have small outlayers [outriggers] on one side." When Dampier and others made a canoe voyage from Great Nicobar to Acheen some natives of the latter place fitted the canoe with double outriggers.

Deep-sea Vessels mentioned in Maori Tradition; Management of same; the Double Outrigger.

We have now examined the evidence concerning the forms of canoes formerly used by the Maori folk of New Zealand. That pertaining to the old-time Maori outrigger is practically nothing, and we know but little concerning the double canoe. As to the single modern canoe, used without an outrigger, we have a very fair knowledge as to its construction. The quoting of observations and descriptions left to us by early writers will probably

be but monotonous reading to the ordinary reader, but it is necessary to bring all these far-scattered notices together. The time has now come to deal more with precise details than has hitherto been the practice of writers describing Maori and Polynesian artifacts, processes, and institutions. We have erred and strayed afar off to note the forms of vessels employed by natives of Polynesia, Melanesia, Micronesia, and Indonesia. This extended survey was made because the Maori came hither from Polynesia, and because, in studying the Maori canoes of old, we find parallels among the craft of those distant regions. Ethnographical studies on an extended scale are now being conducted in the Pacific area, and we can assist the workers by publishing such data as are included in this paper.

Here follow a few notes on the management of canoes at sea as given by Maori experts. We begin with some remarks concerning the voyage from the hidden homeland of Irihia as made by ancestors of the Maori.

One account states that the vessels employed had their parts secured by means of lashings. The migrants steered ever toward the east, and no vessel proceeded alone—always two or more together: such, we are told, is the correct way of traversing sea-roads. On dark, moonless, cloudy nights the course was often kept by noting the damp sea-breeze from the east. On light nights the moon or stars would act as guides to steer by. Should a head wind be encountered, then the vessel was *korewatia*—that is, two heavy stone anchors (*punga taupuru*) were lowered as sea-anchors, to prevent excessive drifting. Also were lowered the *mahe* (smaller stones secured to ropes) at bow and stern, in order to ascertain the set of the ocean current, whether surface or deep currents. If such current were in the very depths of the ocean, then a strong southerly was expected; if at a medium depth, a northern wind was looked for; and if a surface current, then an easterly wind was supposed to follow. There are many signs by means of which rough weather conditions or rough seas were foretold.

When rough weather was foretold by the experts, preparations were at once made by the crew, and the vessel made as snug as possible. The *tokotu* (side stanchions to support awning-frame) were erected, the *whiti* (rods to support covering-mats) also; then the covering-mats were stretched over the *whiti tu*, and, when the storm broke, all was snug. One authority states that fore-and-aft battens (*kaho*) were lashed on to the curved *whiti* rods. Then the outriggers of the canoe were thrust out, the *hokai* (booms) and *huapae* (fore-and-aft poles on booms) were secured, and the *taupa karekare wai* (splashboards) were put on and lashed. The water-guards known as *pare arai wai turuturu* (or *wai parati*) were fastened on. The sail (*ra tauaki*) was then furled, and that known as the *ra turuturu matua waka*, or *ra poto whaiti*, was set or arranged. The ropes, *taura rinoa* (? *rinoi*), outer and inner, were rendered taut, so that the wind might not destroy or twist the sail of the canoe. Two courageous adepts would then occupy the stern as steerers, and two others would manipulate the *hoe whakaara* (lifting-oars) at the bow to keep her head up, while yet another two would be stationed amidships to assist the other four in controlling the vessel. And now the craft would proceed safely on her way.

The reciter of the above matter then went on to describe many weather signs by means of which seafarers of old foretold storms, also sea and weather conditions generally.

Some of the contrivances mentioned above have never been satisfactorily explained. The *taupa karekare wai* was probably a form of washboard fixed on the gunwale. An openwork platform was made by lashing rods to the booms with a little space between them. Upward surging waves are said to have lost much of their force when striking this platform. In the original we note the use of the word *uhi*—"*Ka uhia te taupa karekare wai.*" *Uhi* means "to cover," but would scarcely be used to denote fixing a plank as a washboard; it is employed to express covering as with a mat or garment, or as clouds cover the heavens. The use of the word *tui* is also suggestive. Moreover, the above words occur just after the remark about fixing the outrigger, the booms, and longitudinal

spars. Another native authority states that such platforms were constructed, and that they had the described effect. The above account distinctly mentions outriggers in the plural *nga korewa o te waka* (the outriggers of the canoe)—so that presumably there would be a platform on each side.

The *pare arai wai turuturu* was possibly a plank fastened to the canoe as a wash-strake or guard to repel any water that surged through the platform. *Pare* seems to imply something projecting, while *arai* denotes a warding-off. The two expressions applied to sails apparently apply to two different forms. The *ra tauaki* was probably the ordinary sail, and the *ra poto whaiti* a smaller form used in rough weather or when a squall was expected.

Inasmuch as that portion of the tradition suggesting a double outrigger, and referring to the erection of the awning and the manipulation of sails, is of some importance, it is here given in the original :—

Ki te puta mai te hau matakaka, korahi ranei, i te ahiahi ranei, i te aonga o te ra ranei, kei te panga mai o te ra te tikanga, he puhau ranei, he hau winiwini ranei, he mokohuruhuru ranei. Me he mea he puhau, he hau mapu ranei, he hau pai. Me he mea he winiwini he huruhuru ranei, he kino, kia tupato rawa. Ka mohiotia he kino, ka timata te whakaara i nga tokotu, i nga whiti o te waka ; ka oti, ka whakamaroro haere i nga huripoki o nga whiti tu ; mo te puta rawa ake te tupuhi, kua pai. Katahi ka kokiri i nga korewa o te waka ki waho ; ka oti te taumau nga hokai, nga huapae. Katahi ano ka uhia te taupa karekare wai ; ka mutu te tui, ka whakamaua nga pare arai wai turuturu, wai parati ranei. Ka oti enei, ka takaia te ra tauaki, ka oti te pokai takapau, katahi ka hoatu ko te ra turuturu matua waka, ara ki te ra poto whaiti. Ka whakamarohia nga taura rinoa o waho, o roto, kia kore ai e pakaru i te hau, e takawiri ranei te ra o te waka. I konei ka puta nga tino toa kia rua ki te kei o te waka whakatere ai ; e rua ki te ihu o te waka hai whakaara i te ihu o te waka ; kia rua kei waenganui o te waka hai awhi i te waka kia rewa ki runga, kia mama ai te whakatere a nga tangata o te kei, o te ihu. Heoi, kua pai inaia nei te rere a te waka i te moana.

One of the interesting points of the above narrative is that we are given to understand that not only was the awning erected at sea when bad weather was expected, but also that the outriggers, distinctly mentioned in the plural, were thrust out and fixed to the hull under such circumstances. This statement implies that the outrigger timbers were carried inboard during fine weather. The statement seems clear enough. After describing certain weather signs and winds, the narrative continues : "If it is known that bad weather conditions are approaching, then is begun the erection of the *tokotu* and *whiti* of the canoe . . ." and so on. These remarks seem to allude to practices among Polynesian voyagers of former times of which we have never before heard, and which certainly require some corroboration before being accepted. A verbal explanation by a native of the practice of raising double outriggers from the water by means of ropes termed *taura ripi*, passing through some form of grummet on the masts, is also marked doubtful, and awaits confirmation.

The command "*Uea te waka*" would be given when it was desired that the vessel be brought back to the course, when she had fallen away from it. This term might also be heard when a canoe was being hauled over skids—"*Uea te waka, kia hangai ki waenganui o te rango!*" When, in encountering a head sea, it was desirable to mount the waves at a slight angle instead of at right angles, the same form might be used, or that of "*Kia tapae te ihu o te waka.*" In time of danger an expert at the bow would, by means of arm gestures, show paddlers their course of action. The *amotawa*, or sea experts, who directed operations at sea in rough weather, were adepts at canoe navigation and handling. Their duties were very different from those of the leader and fugleman (*hautu, kai hautu,* and *tapatapa*) who controlled paddlers in uneventful coastal trips. In rough weather at sea two such adepts were sometimes employed, one attending to the bow and dangers ahead, the other to the stern of the vessel and any danger threatening from that quarter.

One of the duties of a directing expert was to warn the crew of approaching conditions, that they might prepare for the proper action. Thus, when he cried "*He wharau te*

ngaru," or "*He whare te ngaru*," it was known that a curling wave with overhanging crest, a "comber," was advancing on the vessel, and that action must be taken to prevent it breaking on board. The call of "*He huka te ngaru*" meant a broken form of wave, a less dangerous form to encounter. The *ngaru tapuku*, or rounded billow, was not dreaded. If running on the course of the vessel, an endeavour was made to balance the canoe upon it, whereupon the smooth swell would carry it swiftly forward on its way. This was the method adopted in landing on a surf-beaten coast when the dreaded *tai maranga*, or heavy sea, was abroad. At such a time, when the canoe reached the summit of the swell, her bow projecting somewhat, there came the command "*Kia aronui te hoe*," and at once every paddle was held with blade vertical in the water, handle hard gripped against the gunwale. This action holds a canoe on the swell-crest. The order "*Korewa te hoe*" caused all paddles to be firmly held with the blades flat in the water; it was heard in various contingencies, as, when a canoe was slipping back off a swell-crest, the change in position of the paddles would cause her to forge ahead. "*Whakaara te hoe*" is a command to the two men manipulating the long *hoe whakaara* at the bow to act in a similar manner. "*Taupuru te hoe*" called upon the steersmen at the stern to act likewise. "*Kumea te hoe*" was a call for strenuous exertion on the part of the paddlers. "*Tiaia te hoe*" was a cry of welcome to weary paddlers, as it means "Go easy." It meant that no danger threatened — that the steersmen had merely to hold the vessel to her course while the paddlers plied an easy stroke.

When weather signs betokened a coming storm the vessel would make for any land in the vicinity. If far out at sea, then the command "*Runaia te waka*" was heard, and the awning was fixed and all made snug. When a storm came up from astern great care was taken to prevent the stern of the vessel from being swung round. This would be effected principally by the sea-anchors. If thus driving in on a coast-line with stone sea-anchors down, men were stationed at the cables as *mataki punga*, or anchor-watchers. By keeping his hand on the rope the tender could detect contact between anchor and bottom, whereupon the former would be hauled up a few feet.

The Arabs on the east coast of Africa, when in shoal waters, take down the sail and lower the anchor, then go to sleep. The craft will bring up before she hits anything.

Tunui-a-rangi, of Wai-rarapa, states that in former times elderly men were extremely clever in the detection of weather signs, and seldom made any mistake, but that this knowledge has been lost since the coming of Europeans, owing to the discontinuance of canoe travelling and sea-fishing.

The time adopted for setting forth on a canoe voyage would be decided by experts in weather-lore. For instance, such a one might say, "The wind will drop this night; to-morrow it will be *aio* (calm); the next day it will be *aio piropiro*, and the next day *aio ukiuki* (two conditions of calm weather). We will therefore start to-morrow, so as to reach our destination during the *aio ukiuki*."

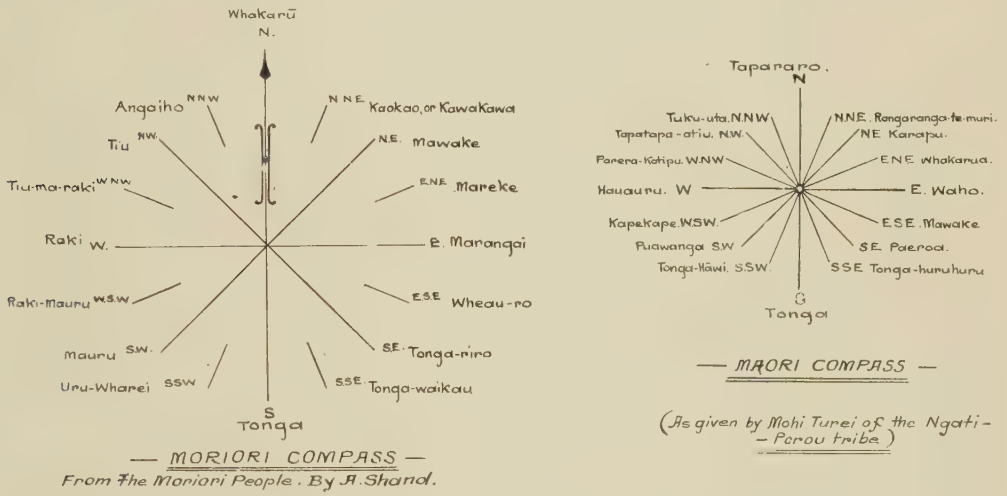
Tuta Nihoniho says that the expression *aio piropiro* is applied to a calm of short duration, as for one or two days, while *aio ukiuki* implies a long-continued calm of perhaps a week. Another term, *mowai rokiroki*, describes a dead calm, when the water has a glass-like appearance. He also remarks that adepts in weather-lore observed closely the appearance of the stars when they wished to know what the weather would be, and also the surface of the ocean. For instance, when the latter presented a certain light-coloured appearance it was known that a long calm period would follow.

The Rev. S. Marsden wrote as follows of one of his experiences in the north in 1814: "As we approached it appeared impossible to us that the boat could pass through the surf; yet two canoes came dashing through the waves (as if they bade defiance to the destructive rocks and foaming billows that rolled over them with a dreadful noise) to direct us where it would be safe for the boat to land."

Compass-points and Wind-names.

In order to designate the points of the compass the Maori in most cases employed the various wind-names, though he possesses a few specific terms for compass-points, such as—*Raki*, north; *tonga*, south; *uru*, west; *rawhiti*, east (also termed *rawhitiroa*); *tonga ma uru*, south-west (literally "south and west"); *marangai rawhiti*, north-east (not universal); *marangai mauru*, north-west (not universal).

The names given in the diagram, with the exception of those for north, south, east, west, and south-west, are wind-names employed by the Ngati-Porou Tribe of East Cape district, and were supplied by Mohi Turei. Wind-names differ considerably in the various districts. Thus *marangai* is employed to denote the north among some tribes; in other places it is applied to the east wind, or a rainstorm. *Muri* denotes the north in some districts. Ngati-Porou call the north wind *tapararo*, the east wind *waho*. The south wind is usually called *hau tonga* (literally, "south wind"), sometimes *tonga parawera-nui*. A westerly wind is *hau a uru* or *mauru*, though the latter term seems to be applied to a north-west wind among some tribes. *Kapekape* denotes a north-west wind in some districts.



[*Diagrams by Miss E. Richardson.*

Fig. 168.—The Compass of Neolithic Man.

Wind-names employed to denote compass-points.

An old expression for the east is *rawhiti maruanuku;* and the east wind is often termed *hau rawhiti*. *Hau raro* and *hau marungai* are terms applied to the north wind.

The word *hau* means "wind," and is also used to denote points of the compass, or direction, as exemplified in the sentence *Me tomo ia tohunga ma te hau o tono marae ake, o tona hau, o tona hau.*

In addition to the ordinary names for the cardinal points of the compass, they possessed others that may be termed honorific titles, or personifications of such points. These were—Huru-nuku-atea, North; Para-wera-nui, South; Tahu-mawake-nui, East; Tahu-makaka-nui, West. These beings were the offspring of Huru-te-arangi and Tonganui-kaea. Parawera-nui married Tawhiri-matea, their progeny being a long list of Wind Children, far too numerous to relate. In accordance with native custom these honorific terms were employed by precise speakers in preference to the common names, even as they referred to the ocean as Hine-moana, and to fire as Mahuika; these being personified forms of sea and fire.

PART VII.

THE PEOPLING OF NEW ZEALAND.

CONTENTS.

Polynesian voyagers. Oral traditions. Discovery of New Zealand by Polynesians. Voyage of Kupe and Ngahue. A lone land. First settling of New Zealand. Coming of the Mouriuri, a people of unknown origin. Second peopling of New Zealand. Coming of the Maori. The voyage of Toi. The coming of Kura-hau-po. Voyage of Manaia and Nuku from eastern Polynesia to New Zealand. Coming of the "fleet." Vessels of the immigrants. The "Arawa" canoe. "Tainui." "Matatua." "Aotea." "Takitumu." "Horouta." Voyages made from New Zealand to Polynesia.

THE discovery and peopling of the isles of New Zealand by Pacific voyagers is a subject of much interest, illustrating as it does the amazing daring, endurance, and ingenuity displayed by the ancestors of the Maori, the old sea-rovers of the vast Pacific Ocean. In the traditions of these natives we see that an uncultured folk, ignorant of metals, of the use of the compass, of the art of shipbuilding, ranged over vast areas of uncharted ocean, and visited and settled innumerable isles from lone Easter to far Nukuoro. We see the dark races of the west occupying a great expanse of the island world, the lighter people of the north inhabiting many far-spread isles, and the comparatively fair Polynesian holding every isle from lone Easter westward to the eastern bounds of Melanesia. In some areas, such as New Zealand, eastern Fiji, and elsewhere, we observe a mixture of the dark and fair races. The movements of these people presents a strange and attractive subject —one that will never be clearly known; but we have a certain amount of evidence that tends to show how the races of Oceania became dispersed over so vast an area, how the innumerable isles and groups were discovered and populated, some in times long past away, some in comparatively late times.

In this portion of the paper will be given native traditions pertaining to the discovery and settlement of New Zealand; the coming of many voyagers from Polynesia, some as settlers, others merely as visitors, together with return voyages from these isles to Polynesia, and the sea traffic that at one time existed between the two regions. In this narrative it will be seen that, after retailing the local traditions, we shall obtain a certain amount of corroboration from several isles of Polynesia, where a knowledge of certain voyages to and from New Zealand has been retained.

In the narration of these voyages made by fearless and capable explorers and voyagers of the Polynesian race it will be seen that, so far as we can judge, the most interesting traditions, those preserving the most detail, have been preserved by the Takitumu people, of the east coast. The vessel of that name is said to have brought from Polynesia several men deeply learned in tribal history, and, to some extent, racial history. This knowledge was preserved by means of establishing or introducing here what may be termed schools of learning, in which, during each succeeding generation, carefully chosen youths were taught the traditions, ritual, and other lore of the race and of the tribe.

As is usually the case with orally preserved traditions—history as conserved by an uncultured folk ignorant of written language—we find that mythical accretions have become attached to genuine historical traditions, and these must be noted by the inquirer.

There can be little doubt that a spirit of adventure led the Polynesians to make many voyages of discovery athwart the Pacific. Many islands were discovered by these explorers, and, as the people became numerous in islands first settled, bands of adventurers broke away and crossed wide seas to colonize lands discovered by their ancestors. We shall see that New Zealand was settled by the Maori in this manner from the isles of eastern Polynesia.

In Maori tradition one Poupaka is said to have been an old-time Polynesian voyager who flourished two generations before the time of Kupe. He is said to have been a daring navigator who braved the perils of the ocean when others feared Tawhiri-matea and his offspring (the winds): hence the saying, "*Tutumaiao Tawhiri-matea, whakatere ana Poupaka*"; as also "*Tutu te aniwaniwa, ka tere Poupaka i te uru tai.*"

The Discovery of New Zealand by Polynesians.

The date of the discovery of these isles by Polynesians has not been fixed, owing to some confusion in genealogical lore, though the date of their settlement by that race is fairly clear. The discovery was made, according to Maori tradition, by two voyagers, named Kupe and Ngahue (the latter being also known as Ngake), at a period probably not less than forty generations ago. We have no particulars concerning Ngahue, but his companion Kupe is said to have belonged to Hawaiki Island (probably Tahiti). His father was a Rarotongan, while his maternal grandfather belonged to Rangiatea, the island now known as Ra'iatea. This tends to show that there must have been communication between these islands at that period. Maori tradition of the South Island claims that Kupe flourished forty generations ago.

Putting aside certain myths concerning the voyage of these old seafarers to New Zealand, no reason for the voyage is given in Maori tradition; most likely it was one of the many voyages of exploration made by members of the daring Polynesian seafarers of yore. The voyage was made apparently from the island of Tahiti, the vessel of Kupe being known as "Matahorua," and that of Ngahue as "Tawiri-rangi." Of the former canoe, or *prau*, we are told that the hull was composed of three pieces, and that these pieces were not let into each other as is done nowadays, but were simply butted together for lashing, the method known as *haumi tuporo*. The washboards were fixed, the two anchors prepared, both of which had holes through which the cables were passed. One anchor was of the stone known as *tatara-a-punga*, obtained at Maungaroa, a hill at Rarotonga. "Matahorua" is said to have accommodated sixty persons. In this expedition Kupe brought his family with him—wife and daughters—a not uncommon occurrence, apparently, among those old sea-rovers.

These voyagers made their landfall near the North Cape, afterwards coming down the east coast to Castle Point, thence to Palliser Bay, where some place-names were assigned. Proceeding, the seafarers entered Wellington Harbour, where the two islands (Somes and Ward) were named Matiu and Makaro, after two of the daughters of Kupe; while Pinnacle Rock, off Seatoun, was named Te Aroaro o Kupe, after the famous explorer. Moving on along the coast, a sojourn was made at Te Rimurapa (Sinclair Head) for the purpose of collecting and drying shell-fish to serve as sea-stores. Next Porirua Harbour was entered, where the anchor known as Maungaroa was left, and another local stone taken in its place. The abandoned anchor is said to be the one now in the Dominion Museum. Our voyagers next called at Mana Island, whence they crossed the strait in order to explore the South Island and to seek human inhabitants, for so far none had been seen. At Arahura a landing was made, and here greenstone (nephrite) was discovered, pieces of which are said to have been taken back to Polynesia by Kupe and Ngahue. The stone was first seen by Hine-te-uira, another daughter of Kupe, whose fourth daughter, Mohuia, also accompanied him. Hine-waihua, wife of Ngahue, and Hine-te-aparangi, wife of Kupe, were both with the expedition.

The explorers are said to have sailed right round the South Island, after which they returned north by way of the west coast of the North Island, calling at Whanga-nui, Patea, and Hokianga. From the latter place our voyagers sailed on their return voyage to Polynesia.

An important part of this tradition is the statement that, at that period, the isles of New Zealand had no human inhabitants; it was a desolate land. It was Kupe who gave the name of Aotea-roa to New Zealand. All these voyagers returned to their homes in eastern Polynesia: none remained here. One tradition states that Ngahue killed a *moa* at a place called Wairere, and took some of the preserved flesh with him on his return to his island home. The version collected by the present writer states that a *moa* was killed at a *wai-rere* (waterfall or cascade) up the Arahura River, when the voyagers were collecting greenstone (nephrite) from the bed of the river, and that Ngahue, on his return to Polynesia, reported that greenstone and the *moa* were the most remarkable products of Aotea-roa. "*Ka patua te kaitiaki o te rere, te moa, ka hoki a Ngahue ma ki tera motu, oti atu. I hoki ano a Ngahue ki Hawaiki, nana i korero he pounamu, he moa te taonga o tenei motu, o Aotea.*"

Our explorers returned to Rarotonga, thence to Rangiatea (Ra'iatea, in the Society Group) and Hawaiki, which latter name was an old one for the Island of Tahiti. On their return the voyagers were called upon to describe their voyage, the aspect and productions of the newly discovered islands, and the course to be taken by vessels desirous of reaching them. All this information, we are told, was carefully preserved by the adepts whose duty it was to conserve all desirable knowledge and transmit the same orally to the next generation.

So far as is shown in Takitumu tradition no other Polynesian voyager reached New Zealand for a long time after its discovery by Kupe and Ngahue, but when Toi, Manaia, and others, probably two hundred years afterwards, wished to visit these isles, they applied to the wise men of their time for the sailing instructions left by Kupe. Those instructions were that the voyage to New Zealand should be made in November, and that the course to be steered from Rarotonga was to keep the bow of the vessel just to the right of the place where the sun sets in daytime, and of the moon or Venus during the night. In connection with this, Mr. S. Percy Smith has written as follows: "The sun sets about S.W. by W. in the end of November in New Zealand, and that is almost the exact course from Rarotonga, which was always the starting-point for New Zealand." *

We here have a very much abbreviated account of the discovery of New Zealand by Polynesian explorers, as preserved in Maori tradition, together with a statement that these isles were at that period uninhabited by man. Now, the next Polynesian voyager to New Zealand, according to Takitumu tradition, was one Toi, who found many parts of the North Island occupied by a people differing much from those of eastern Polynesia in appearance, and apparently in culture. These aborigines are known to the Maori as Maruiwi and Mouriuri; of these the latter is said to be the more correct name, the former being merely the name of one of their chiefs at the time when Polynesians first settled on these shores.

The First Settling of New Zealand: The Coming of the Mouriuri, or Maruiwi, Folk.

Inasmuch as the later-coming Polynesians were a superior, more virile and warlike folk than the original inhabitants of these isles, it followed that, as soon as their numbers permitted such a course, they fell upon the Mouriuri folk and destroyed them, though this was not effected until a considerable amount of intermarriage had taken place. It also was a natural sequence that the Maori should not preserve much detailed information

* In other accounts it is stated that the bow was directed to the left of the sun.

concerning an inferior and conquered people. It is also recorded in tradition that the aborigines were a folk who did not carefully preserve their history and genealogical records as did the Maori. These are two reasons that serve to explain our ignorance of the origin of New Zealand's first settlers. What little has been preserved is given below.

The Mouriuri aborigines were the descendants of the crews of three canoes that had been driven from the waters of their homeland by a westerly storm, and, after a long drift, made the Taranaki coast, where the ocean waifs settled. The name of the land they came from was given as Horanui-a-tau, and also as Haupapa-nui-a-tau; it was described as an extensive land, larger than the North Island of New Zealand, also having a much warmer climate. These two names of the Mouriuri homeland tell us nothing.

It is clear that this tradition is not trustworthy; that we cannot assume that the drift canoes came from a large island to the west of New Zealand, for that would make Australia their former home, and we know that the savages of Australia and Tasmania were incapable of making sea voyages, of so rude and flimsy a nature were their vessels. The drift canoes may have been driven from home by a westerly wind, but may have been influenced by other winds, and ocean-currents, later on. The statement concerning a large land is also a doubtful one, for, omitting Australia, we must go far away to New Guinea to find such a land. Possibly the original home of the Mouriuri folk was New Caledonia, the New Hebrides, or the Fiji Group.

Traditional accounts of the aborigines describe them as a spare, slim-shanked, and dark-skinned folk, with bushy or outstanding hair, having flat noses with upturned nostrils; an indolent and chilly people, fond of hugging the fireside. They had a curious habit of looking sideways out of the corners of their eyes, and were noted for treacherous behaviour. They built rude huts, and wore but little clothing—a rough cape in winter, and merely some leaves in summer.

In order to meet this description we must certainly leave Polynesia alone and enter Melanesia, no Polynesians answering to such a description. One argument against the assumption that the Mouriuri were a Melanesian folk, however, is that certain names, tribal and personal, pertaining to them are purely Polynesian in form and phonology. If these names are genuine, and truly aboriginal, then the Mouriuri must have spoken a Maori tongue. It is scarcely credible that a people whose physical peculiarities were such as are described above should have spoken a tongue so purely Maori as is shown by such names as the following:—Canoes of Mouriuri immigrants: Okoki, Kahutara, Taikoria. Tribal names: Rua-tamore, Te Pananehu, Tai-tawaro, Mamoe, Koaupari, Te Wiwini. Personal names: Maruiwi, Pohokura, Whatu-mamoe, Piopio, Tawhiri, Matakana.

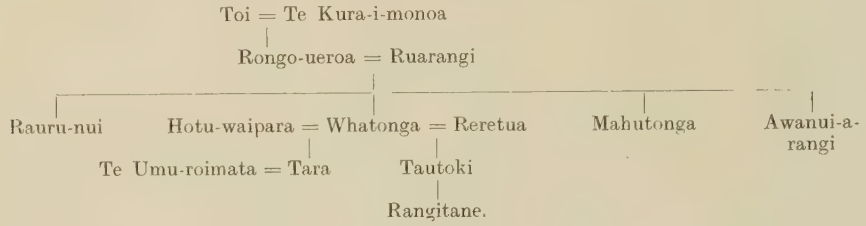
In the eastern part of the Fiji Group we may observe a people of mixed descent, Polynesian and Melanesian; they are well formed and by no means of repulsive appearance. The tongue they speak contains many Polynesian words. It appears highly probable that either the description preserved of the aborigines is incorrect, or that they certainly did not speak a Maori—that is to say, a Polynesian—tongue.

The next voyager to reach New Zealand, according to Takitumu tradition, was one Toi-te-huatahi, a native of the Society Group, of eastern Polynesia. When he arrived on these shores, about seven hundred years ago, or somewhat more, he found the aborigines a numerous people occupying the North Island from Oakura, Taranaki, northward to Hokianga, and down the east coast to Hawke's Bay. This means that no inconsiderable period of time must have elapsed since the arrival of the few castaways of the Mouriuri. Presumably that period would be one of several centuries.

The Voyage of Toi and Settlement of Polynesians in New Zealand: "Te Paepae ki Rarotonga" brings the First Polynesian Settlers to Aotea-roa.

The voyager Toi, whose full name was Toi-te-huatahi, was a native of the Island of Tahiti, formerly known as Hawaiki. He flourished some thirty generations ago, which,

allowing twenty-five years to a generation, would mean about the end of the twelfth century. His grandson Whatonga, shown in the table below, was connected with the famous voyage of Toi, and settled in New Zealand.



The primary cause of Toi coming to New Zealand, and of the first settling of natives from eastern Polynesia on these shores, was one that has had a very important and far-reaching effect in the discovery and settlement of the isles of the Pacific: it was a drift voyage. A number of natives from an island known as Ahu were on a visit to Tahiti when they issued a challenge to the natives of that place to engage in a canoe race. This was accepted, and took place some time afterwards in the lagoon known as Pikopiko-i-whiti, at Hawaiki, the people assembling at a place called Whanga-ra. The spectators gathered on the hill Puke-hapopo saw that "Te Wao," the canoe of Whatonga, was leading as the racing craft passed out of the lagoon into the open ocean. The contest was continued for some distance, when suddenly a strong offshore wind sprang up, and the racing fleet was in difficulties. Those vessels nearest land succeeded in returning to shore, but those farther out were carried away by the gale across the ocean. Some of these waifs were carried as far as the Samoan Group, where castaways were subsequently found. The vessel of Whatonga got separated from the others during the gale, and, when the storm at last ceased, a sea-fog obscured all surroundings, so that aimless paddling resulted. When the fog lifted, land was seen at some distance, which our drift voyagers made for. That land was the Island of Rangiatea, now known as Raiatea (Ra'iatea)—for the natives of the Society Group have lost from their language the two sounds *ng* and *k* since the ancestors of the Maori left those parts for New Zealand. Our ocean waifs safely reached this island, where they met with some curious adventures that we have no space to relate, and remained there for some time. We will there leave them for a while, and return to Tahiti.

When the storm had abated, the distressed friends of the drift voyagers manned several vessels for the purpose of searching for the absent canoes and their crews. Toi set forth to seek his grandson Whatonga in a vessel named "Te Paepae ki Rarotonga," and visited many isles to the westward, as far as the Samoan Group. Not succeeding in his quest, he sailed southwards, still seeking his relative, until he reached Rarotonga. Finding no trace of the fugitives, he resolved to cross the Southern Ocean to Aotea-roa, the land discovered by Kupe in past times, in case the drift vessel of Whatonga might have reached these shores.

Toi did not succeed in making his landfall on the coast of New Zealand, as he kept too far to the eastward, but he discovered the Chatham Isles, after which he seems to have wandered about the ocean until he sighted the North Island, eventually landing in the Tamaki district (Auckland Isthmus), which he found occupied by the aborigines. These folk are said to have been so numerous that the place was compared to a *rua roro*, or ants' nest. As, however, the aborigines are shown to have cultivated no food products, they could not have lived together in large numbers; doubtless exaggerations have crept into these old tales.

After sojourning among the aborigines for some time, Toi and his companions went to Aotea (Great Barrier Island), thence down the coast to Mayor Island, which he named Tuhua, after the island of that name in far-away Polynesia, an island also known as

Ahu and Maiteka. He then proceeded to Whakatane, where, with his companions, he settled. Here we will leave him for the present and return to Polynesia, there to observe the further adventures of Whatonga.

Voyage of "Kura-hau-po" to New Zealand.

We left Whatonga and his companions as castaways on the Island of Rangiatea, at which place they made a long sojourn, but eventually managed to return to their homeland. On their arrival there Whatonga found that Toi had sailed westward in search of him, and had not returned. Hence he resolved to go in search of him, and procured a deep-sea canoe named "Te Hawai," apparently an outrigger, for his voyage. This craft he renamed "Kura-hau-po." It is said that its hull was composed of four pieces—that is, it had one *haumi* at the bow end and two at the stern end. It was fitted with twenty-six thwarts and with *pairi* (side boards or washboards), and was provided with two anchors and two bailing-places (*puna wai*). The vessel was treated with some vegetable gum, then dressed with shark-oil, after which it was painted with a preparation of red ochre. The paddles, bailers, and other gear all had special names assigned to them, as was usual in such cases. The crew consisted of fifty-two paddlers (two to each thwart), four caretakers of the vessel (whose duties are not explained), two anchor-tenders, four sail-tenders to attend to the ropes of the sails, two steersmen at the stern, and two fire-tenders, making sixty-six in all.

There appear to be no records of the wanderings of "Kura-hau-po" westward of the Society Group until she reached Rarotonga, in the Cook Group, where Whatonga learned that Toi had sailed for Aotea-roa in search of him. He therefore prepared for a long voyage, for he intended to follow Toi across the ocean to New Zealand. "Kura-hau-po" sailed for New Zealand in the month of Tatau-urutahi (? October), steering a course to the south-west, and made her landfall at Muriwhenua (North Cape district). She then ran down the western coast and landed at Tonga-porutu (northern Taranaki). Here Whatonga learned that Toi had reached this Island, and was living in the Bay of Plenty. This information he obtained from the aborigines—which looks as though the Maori-speaking Polynesians understood their tongue. Whatonga then determined to sail northward, double the North Cape, and reach the Bay of Plenty. This he did with a reduced crew, for some members of it settled among the Mouriuri folk of Tonga-porutu. Eventually Whatonga reached the Bay of Plenty and landed at Maketu, where the aborigines directed him to Whakatane, the home of Toi. At that place met the two bold voyagers who had navigated their primitive vessels across thousands of miles of the vast Pacific.

In the crews of these vessels of Toi and Whatonga we see the first Maori settlers of New Zealand. One of Whatonga's companions, Tama-ahua, is said to have returned to eastern Polynesia. Prior to his return to the homeland he headed an expedition to Arahura, South Island, in order to obtain greenstone (nephrite), so highly prized by the Maori. Three canoes, named "Otauira," "Potaka," and "Whatupurangi," took part in this expedition, the first-named being the vessel of Tama-ahua.

From this time onward for several centuries many Polynesian voyagers reached New Zealand. In many cases the crews remained here, in others they returned to the northern islands: thus voyages to and fro between the isles of Polynesia and New Zealand took place. Those who settled here intermarried with the aboriginal Mouriuri and produced the mixed folk known as the Tini o Toi—the Toi tribes found here by the late-coming immigrants from eastern Polynesia about the fourteenth century. As the mixed folk became more numerous and powerful they attacked and destroyed the aborigines, who were exterminated; but the Maori of to-day is of double descent, and in many cases shows his Mouriuri ancestry in his features, hair, and skin-colour.

We will now pass on to the next voyage made by Polynesians to these shores, as recorded in Maori tradition.

The Voyage of Manaia and Nuku to New Zealand.

Shortly after the arrival of Whatonga, another expedition, composed of four vessels, arrived here from eastern Polynesia. The cause of this movement was as follows: Two chiefs, named Manaia and Nuku, quarrelled in their island home, Manaia having killed a relative of Nuku. Being dubious of his ability to hold his own, Manaia manned a seagoing canoe named "Tokomaru" and sailed for New Zealand, here to seek a new and more peaceful home. Nuku fitted up three vessels and started in pursuit. Of these craft "Te Houama" was a single canoe, doubtless fitted with an outrigger; the other two, "Waimate" and "Tangi-apakura," were double canoes. These vessels made for Rarotonga, whence they started on the voyage to New Zealand. Of that voyage we have no details until the canoes reached Cook Strait. Nuku called at Rangitoto, or D'Urville Island, which he is said to have named after a place or island in eastern Polynesia, and eventually came across Manaia at sea off Pukerua. A fight occurred at sea, after which the matter was fought out on the beach of Pae-kakariki. Having settled their differences, with some loss of life, Manaia sailed northward to Kaipara, and afterwards to the Bay of Plenty and to Tokomaru, on the east coast. The latter place is said to have been named after his vessel. Manaia returned to the west coast, to Whaingaroa and Taranaki, and the Atiawa folk of Taranaki claim him as an ancestor.

Nuku did not remain here, but returned to Polynesia. It is said that he separated his two double canoes and sailed them back as single vessels, which would be provided with outriggers.

We now come to a period of probably two hundred years during which many voyages were made to and from New Zealand. The names of many vessels that arrived here from Polynesia have been preserved, as also those of some vessels or voyagers that left here for the northern islands; in all probability others have been forgotten. It is, however, impossible to place them in proper order as to date of arrival.

Some of the vessels that are said to have come hither from Rarotonga were named "Rangiahua," "Aotearoa," and "Mapouriki"; but this was in later times. "Te Karaerae" and "Pou-ariki" were two others; yet others were "Niwaru," "Wakanui," "Mahunui," "Mangarara," "Tere-anini," "Te Aratauwhaiti," "Te Mahanga-a-Tuamatua," and "Mamari," concerning which we have but little information. "Rangi-matoru" was a vessel that made the land at Ohiwa at some time prior to the arrival of "Matatua." "Otureareo" reached the same port, and is said to have brought some plants of *aute* (*Broussonetia papyrifera*). Their crews settled at Ohiwa. The vessel named "Nukutere" is said to have come to land at Waiaua, east of Opotiki, where her crew remained. Another, known as "Te Paepae ki Rarotonga," came to land at Tara-o-muturangi, near Matata; but another tradition gives this as the name of the vessel of Toi. Colonel Gudgeon has stated that the Rarotongans have preserved a knowledge of this canoe. Ngati-Ira, of Opotiki, say that a canoe from Polynesia named "Tuwhenua" landed at Motu, Bay of Plenty. Others state that "Te Waka Tuwhenua" was a vessel so named because its crew introduced a form of leprosy (*tuwhenua*) here, but that the real name of the canoe was "Te Riu-kakara."

Among the natives of Whakatane district exists a tradition that, many generations ago, a canoe arrived at Whakatane from some distant land. Its crew was composed of a very dark-skinned folk, whose skin-colour, it is said, "*kaore i hapa i to te mangumangu*" (*i.e.*, did not differ from that of a negro). These people settled at Omeheu, on the Rangitaiki River, but gradually became lost to the world—presumably by intermarriage, possibly in other ways.

In vol. 14 of the *Journal of the Polynesian Society* is some account of the coming of a people known to the Maori as Ngutu-au. Their origin is unknown, but they reached Whare-kahika (East Cape district) in a canoe of remarkable construction. This latter statement would simply mean that it differed from Maori canoes. They lived for some time at Matakawa, and then left to return to their distant home.

Yet another vessel that reached the east coast from Polynesia was that in which came a woman named Hine-rakai, who was in search of her brother, Tu-te-amokura, who had been carried away to sea in a drift canoe. These voyagers remained here, and their descendants are among the Wahine-iti Tribe.

A number of names of other vessels that are said to have reached New Zealand from Polynesia are given in Tregear's *Maori Dictionary* and in vols. 1 and 12 of the *Journal of the Polynesian Society*.

We now come to an important immigration of people from eastern Polynesia that took place about the fourteenth century, or twenty generations ago. These people appear to have left the Society Group on account of quarrels and intertribal fighting—quite possibly those isles had become overpopulated—and made the voyage to these shores in large seagoing canoes named "Te Arawa," "Tainui," "Takitumu," "Matatua," "Aotea," and "Horouta." There were possibly others, but these names appear to be agreed to by all. Of these vessels the "Arawa" is occasionally spoken of as a double canoe, and she is said to have carried two sails, which also means two masts. "Aotea" and "Takitumu" (also known as "Takitimu") are distinctly stated to have been outrigger canoes, and probably others were of the same type. It seems probable that many of the vessels that came hither from Polynesia were of the outrigger type.

In a lecture delivered at Auckland by Mr. Watkins on the subject of the vessels by which certain ancestors of the Maori came from eastern Polynesia to New Zealand about twenty generations ago, the speaker remarked: "From various traditions and legends it could be gathered that the canoes were double canoes, that they had masts, a deck-house, and a stage above it. There was every reason to believe that the Maori war-canoe, as seen by Europeans when New Zealand was first discovered, was a comparatively recent invention, and was adopted by the Maori colonists to meet the new conditions they were placed in when they finally settled down in New Zealand, and when communication with Polynesia ceased." This statement as to double canoes has been made by several writers, but the most reliable evidence is to the effect that both forms of vessel, double canoe and outrigger, reached New Zealand. In Watkins's painting of the coming of the Maori, the masts appear to have shrouds and ratlines, a purely Paumotuan form, and one that is hardly likely to have been used in voyages hither from the Society Group five hundred years ago. The canoes are depicted as double, and decked throughout, having a low bulwark, except in the middle. The dugout hulls have apparently but one top-strake. The sails seem fairly correct. In Goldie's painting of the coming of the Maori the canoes are also shown as double. There are three dubious features noticeable —(1) The carved prows of Maori form; (2) the sail is provided with intermediate longitudinal spars; (3) the women appear to be all long-haired and the men short-haired, whereas the reverse was the Tahitian and Maori custom.

It is, of course, impossible to state precisely what was the form of the Society Islands deep-sea vessels, and their fittings, five hundred years ago, but it is improbable that they were fitted with the highly carved prows peculiar to the *waka taua* of New Zealand, for that was probably a local production. A form of arrow-head sail of Melanesia was in use at the Society Group in Cook's time, but quite possibly had not been adopted there when the Maori left those parts, or we should presumably know something of it here.

Mr. Fenton, in speaking of the vessels used by these far-voyaging Polynesians, remarks: "It is supposed that they were the double canoes still used in the Pacific Ocean, which are vessels of considerable strength and great speed, of which the use and construction have long since been discontinued in New Zealand. Whatever was the size and form of the craft used by these navigators, it is clear from the legends that they had houses on deck, and were capable of carrying many people. . . . The vessels used by the navigators may have been of a much more powerful and efficient type than is now

known amongst the South-Sea-Islanders." Again, he writes: "A people living at a place or in a country called Hawaiki constructed powerful vessels in the form of double canoes, with decks and houses amidships, capable of carrying considerable numbers of people, with the requisite food-supplies; that they were propelled by paddles worked by strong crews, and by sails attached to three masts; that they were capable of withstanding storms; and that they could progress in any direction that the commanders desired." This is a sample of the remarks made by writers on the coming of the Maori. The statements about the double canoe, deck-house, and three masts all seem to centre round the "Arawa." "Takitumu" and "Aotea" are distinctly said to have been single vessels. Nor is there any reason to suppose that the islanders ever possessed any more efficient vessels than those seen by early voyagers and missionaries at the Cook, Society, Paumotu, and Tongan Groups.

The following note was communicated to the late Mr. John White by a member of the Nga Rauru Tribe: "Our ancestors were skilful navigators on the great ocean, as is shown by the many voyages they made hither from Hawaiki, and also from these isles back to those lands. They studied and were acquainted with the prevailing winds during the different seasons of the year, also the movements and positions of the stars in each month, hence they could safely cross the ocean. Also, they knew the proper places from which to set out from Hawaiki for these isles, and the places here from which to start for Hawaiki."

In New Zealand there were certain recognized starting-places for vessels leaving these shores in order to return to Polynesia. Mr. White has recorded some of these places in the north, such as Manga-whai, Waka-tuwhenua, and Whanga-te-au, which are near Te Kawau, Whanga-rei. Another was the bay or inlet known as Te Au-kanapanapa, on the same stretch of coast.

The "Arawa" Canoe.

Some of our native correspondents assert that the vessel known as "Te Arawa" was a double canoe, but there appears to be no detailed description of her preserved in any tradition. In Sir George Grey's account of the coming of the "Arawa" there is no word in the original about the vessel being a double canoe, but in the translation a remark to that effect has been inserted by the translator.

In a Maori manuscript written by Wi Maihi, of Rotorua, and now in the Auckland Public Library, is a representation of the "Arawa" canoe, made by the writer. This crude sketch shows a single canoe with a very peculiar form of prow, consisting of a horizontal beam, on which, in a vertical position, are three projections arranged in a row, and ornamented with feathers, apparently. Secured to the top of the foremost one of these upright pieces is what seems to be a bar or plank that projects out in front of the canoe, and under which are written the words *te tohu* (the sign, mark, or pointer. (See fig. 157A, p. 231.) As to what the writer meant we are at a loss to know. The sketch may represent some form of figurehead used at the time of the last immigration from Polynesia—that is, in the time of the "Arawa" canoe. It is well worthy of note that the ordinary double canoe of Tahiti, called by Ellis a *tipairua*, was furnished with a plank that projected out horizontally in a line parallel with the surface of the water. It was 5 ft. or 6 ft. long, and 12 in. to 18 in. wide; it was known as the *ihu va'a* (Maori *ihu waka*). Illustrations of these canoes in Ellis's *Polynesian Researches* and *Cook's Voyages* show the flat projecting prow-piece and high stern-pieces described by Ellis. (See figs. 153–155, pp. 218–222.) These vessels are described elsewhere in this paper. They were used in coastal work; the larger deep-sea vessel differed in form as to the prow. The flat prow depicted by Wi Maihi may have been in use on deep-sea canoes when the "Arawa" was afloat, five hundred years ago. Porter states that the Marquesas canoes he saw had a flat prow that projected 2 ft. (see "Canoes of the Marquesas Group"),

which sometimes had a board attached to it, but in what position is not clear. A plate in *Cook's Voyages* shows carved upright pieces at the prow of a Marquesas canoe, and such projections appear on the prows of canoes of other groups. (See fig. 157, p. 230; also fig. 65, p. 101.)

The Rev. R. Taylor, in his *Te Ika a Maui*, remarks of the "Arawa" canoe, "Ngatoro-i-rangi did not live inside the canoe [on the voyage to New Zealand], being too sacred a person, but on the top, the canoes having houses built on them, with side poles, probably outriggers, and roofed with raupo." This sentence is none too clear: presumably the "side poles" pertained to the canoe, not to the house. The canoes of the Society Group (whence came the "Arawa") had in some cases awnings or roofs, also an elevated platform. Awnings were used on the canoes that came to New Zealand, but we do not know that any stable form of house or cabin was erected on them.

No details of outstanding interest have been preserved concerning the voyage of the "Arawa" to these shores. On arriving at Cape Colville the *mauri* of the vessel was left there. Every vessel that reached these isles from Polynesia seems to have had certain ritual performed over it prior to leaving, and also to have been provided with a *mauri*. This was a sort of talisman, a material object which served as a shrine or abiding-place for the gods under whose care the vessel was placed. It represented the welfare of the canoe and its crew. A canoe, house, village, or land may have such a *mauri*, which is rendered effective by, and possesses virtue only after, certain ritual has been performed over it. This object, the *mauri* of the "Arawa," has ever been included or mentioned in ritualistic chants by the descendants of the crew of the "Arawa" for the past five hundred years. It imparts force and power to such effusions.

The "Arawa" ended her long voyage at Maketu, in the Bay of Plenty, where she is said to have been shortly afterwards burned by some of the original inhabitants of the land. Her crew settled in that district among what are termed the Toi tribes, who were a mixed people of Polynesian and aboriginal descent. They were originally known as Nga-Oho, but in later times took the name of Te Arawa as a tribal name.

According to superior tradition the burning of the "Arawa" was an accident. Raumati, son of Tama-ahua, when on a visit to Tauranga, from Taranaki, went to Opua, up the Kai-tuna River, to see the famous "Arawa" vessel, where, owing to a carelessly left camp-fire of his party, the canoe-shed and its valued contents were burned. This enraged Nga-Oho, who attacked the party and slew Raumati, whose head was secured by Hau-tupatu, who stuck it on the hand-grip post of his latrine as a *tekoteko*. Raumati was a member of the local tribe known as Te Piri-rakau, a division of Te Tini o Toi, through his mother, Tauranga—hence his visit to this district. Raumati married Te Kura-tapiri-rangi, of Kawhia, and had a daughter named Uru-te-kakara, who married Ngarue. Concerning this pair a long and interesting story has been preserved, in which Whare-matangi, son of Uru-te-kakara, leads a party from Taranaki to the Bay of Plenty to avenge the death and degradation of his grandfather. It was after the burning of the canoe that the immigrants by it, Nga-Oho, assumed the tribal name of Te Arawa.

A vessel known as "Puketea-wainui," commanded by one Ruaeo, arrived at Maketu shortly before "Te Arawa." Ruaeo had been included as a member of the crew of "Te Arawa," but had been deserted by Tama-te-kapua, who, however, brought Whakaotirangi, wife of Ruaeo, with him. Ruaeo, evidently a man of resource, at once fitted "Puketea-wainui" for a sea voyage, sailed forth on the trackless waste of Hine-moana, and reached Maketu before the "Arawa" arrived there from Whanga-paraoa. The subsequent proceedings, when Ruaeo and Tama met, were marked by incisive remarks and strenuous action.

"Tainui."

The "Tainui" canoe came in company with the "Arawa," "Matatua," and others. "Horouta" is not always included among these names. "Tainui" was hauled across the

Otahuhu portage at Tamaki, and proceeded down the west coast of the Island to Kawhia and other places. The above vessels, with about four others (possibly more), left Tahiti about the same time, and several of them reached Whanga-paraoa, on the east coast of the North Island, at the same time, or nearly so. From that place they went their different ways in search of new homes for the immigrants.

The majority of the "Tainui" folk settled at Kawhia and its vicinity; they became the progenitors of the tribes of the Waikato and surrounding districts. All these immigrants by the various vessels intermarried with the mixed folk then inhabiting these Islands. "Tainui" is said to have been hauled ashore at Kawhia, and there left, the spot being marked by two stones. These stones were named Puna and Hine, after the stone anchors of "Tainui," the former being placed at the bow of the vessel and the latter at the stern. These stones are still in position, and are said to be 86 ft. apart (see *Journal of the Polynesian Society*, vol. 24, p. 45), though a writer in the *Otago Witness* of the 23rd July, 1904, states that the distance between them is exactly 66 ft., which is probably nearer the mark. The stone marking the former position of the stern is 2 ft. 6 in. in height, the other is a few inches over 4 ft. above-ground. The stones are a coarse indurated sandstone.

In a paper by Tati Salmon on the Ariki of Tahiti, published in vol. 19 of the *Journal of the Polynesian Society*, it is shown that the natives of Tahiti have preserved a knowledge of "Tainui," and of the chiefs Hoturoa and Hotunui, who brought it to New Zealand. Prior to coming here this vessel made several voyages to the Paumotu and Marquesas Groups.

According to Maori tradition, "Tainui" was about 90 ft. in length. As the Maori puts it, "*Ko Tainui waka e kiia ana te roa tekau ma rua takoto o nga tangata roroa nei*" ("As to the 'Tainui' canoe, it is said that its length was twelve *takoto* of tall persons"). This was a pre-European method of measuring. The human standard laid himself prone and stretched an arm forward, and the distance from the soles of his feet to the end of his extended arm was his *takoto*. A tall man would cover about 7½ ft., or a little more.

"Matatua."

"Matatua" was another vessel of the fleet that arrived here about the middle of the fourteenth century. Some of her crew landed at Whakatane, in the Bay of Plenty, and intermarried with the numerous population already in occupation, the Tini-o-Toi. The Ngati-Awa, Whakatohea, and Tuhoe Tribes claim descent from the "Matatua" immigrants. Apparently most of the crew of the "Matatua" went northward, taking their vessel up the coast to the Nga-Puhi district, where they settled.

The Tahitians have also preserved a traditional knowledge of this vessel, as shown in the above-mentioned paper. "Matatua" seems to have made a voyage to the Marquesas ere she came to New Zealand. As the name of this vessel is often mispronounced by us, it is as well to state that the two first vowels are long—Mātātua.

We have seen that Polynesian voyagers always made Rarotonga their final starting-place for New Zealand, hence it might be thought that the natives of that island would possess some knowledge of such movements. This is so, for an old native of Rarotonga, one Tamarua, informed Mr. S. Percy Smith that in former times the following canoes left that island to convey migrants to a new home: "Te Arava," "Kura-au-po," "Matatua," "Mamari," "Tokomaru," "Tainui," and "Takitumu." Bearing in mind the fact that the Rarotonga dialect has dropped the aspirate and replaced *w* with *v*, we have here the same names that the Maori of New Zealand has preserved. Tamarua also stated that "Takitumu" returned to Rarotonga, which is corroborated by Maori tradition. This old man also said that a voyager named Ngahue went to New Zealand in olden times, at which place he obtained greenstone (nephrite) and saw huge birds called *moa*, some preserved flesh of which he took back to Rarotonga in a calabash. If this is a genuine

tradition it certainly agrees with the Maori version. Tamarua did not know the name of the "Aotea" canoe; he called New Zealand "Aotearoa," its well-known Maori name. The immigrants from the Society Group named many places in New Zealand after places at Tahiti, Raiatea, and other islands.

Colonel Gudgeon states that there is a place named Matatua on the Island of Rarotonga, and local tradition states that from that place the "Matatua" canoe started for New Zealand.

"Aotea."

This was another vessel of the fleet that arrived here about twenty generations ago. The crew settled in the Taranaki district, and their descendants are among the Taranaki Ruanui, and Rauru Tribes, with others of the Whanga-nui district. This canoe is said to have called at Rangitahua (Sunday Island, in the Kermadec Group). It is probable that other voyagers called there, and that it has been occupied in past times. Sling-stones, and stone adzes of Polynesian form, have been found there. The Rarotonga natives knew of its existence, and its Maori name, Rangi-tahua. An account of "Aotea" and her voyage to these shores was published in vol. 9 of the *Journal of the Polynesian Society*, in which occur some brief notes of a former voyage or migration from a place called Te Paparoa i Hawaiki, which looks like a descriptive name. During that voyage the following islands were visited: Whanga-paraoa, Tutuhira (Tutuila, Samoan Group), Rarohenga (Olosenga), Kuparu (Upolu), Wawau-atea (? Vavau, Society Group), and Maiteka (Maite'a, east of Tahiti).

Turi, commander of the "Aotea," is remembered by the natives of Tahiti, and also by those of Mangaia. The latter say that he returned to Tahiti from New Zealand, calling at Mangaia on his way.

Tradition states that seeds of the *karaka* tree (*Corynocarpus laevigatus*) were brought from Rangi-tahua, or Sunday Island, to New Zealand on "Aotea." This tree is found at Sunday Island, also in New Zealand, but whether it was indigenous at the latter place cannot now be proved. It is certainly not found here growing as a forest-tree, but only at or near places occupied or formerly occupied by natives.

One tradition states that "Aotea" was decked and had a house amidships. According to the Rev. T. G. Hammond, our best authority on "Aotea" traditions, this vessel was an outrigger canoe, not a double canoe. She may have had some form of awning or small cabin. As to a deck, all these vessels had a deck or floor fixed just below the level of the top of the hull, below the side boards, such as we see in the larger Maori craft, but they were not decked over as are our boats. Partial decking at the bow and stern ends is a well-known Polynesian usage, but the middle part of the hull is in such cases left open. Elevated platforms are occasionally alluded to as decks.

The "Aotea" canoe is supposed to have sailed from Raiatea Island (known to the Maori as Rangiatea) for New Zealand, and the natives of that isle say that, though its commander, Turi, never returned there, his spirit did so, and used to trouble them much. Curiously enough, the Maori of this land say that nothing is or was known of the death of Turi, and that his spirit is supposed to have returned to Polynesia.

In connection with the subject of Polynesian knowledge of Maori traditions, we may note that the Ngati-Kuia Tribe, of the Pelorus district, has preserved a tradition that the "Kura-hau-po" canoe, of which Whatonga was chief, was originally known as "Tarai-po." In vol. 19 of the *Polynesian Journal* is mentioned a Rarotongan tradition that "Tarai-po" was the name given to a canoe built by the brothers of Atonga (Maori, Whatonga).

The traditions of the vessels named "Kura-hau-po," "Te Ririno," and "Te Karaerae" are confusing, as they are said in some versions to have arrived at New Zealand at about the same time as "Takitumu," while in others they reach these shores some two hundred years or more before that time. As such vessels could not survive for such a period, it is possible that the old names were reapplied to vessels constructed at the later period.

Turi, the commander of "Aotea," is shown in the accompanying table to have been a descendant of Toi, leader of the first party of Polynesians to settle in New Zealand. "Aotea" is sometimes styled "Aotea-roa," and is said to have been named after this land of Aotea-roa, or New Zealand. This vessel was left at Aotea Harbour, her crew proceeding by land to Taranaki, where they settled among a folk of mixed aboriginal and Polynesian descent.

Toi
Rongoueroa
Rauru
Rakau-maui
Rongotea-tau-karihi
Puruora

Turi Kewa.

"TAKITUMU" (SOMETIMES STYLED "TAKITIMU").

This was another vessel of the historic fleet, and of which we have a more satisfactory account. In this case we have a full description of the canoe and the names of its fittings and appurtenances, such as was not preserved, apparently, in connection with any other vessel.

The "Takitumu" or "Takitimu" canoe was made at the Island of Hawaiki (Tahiti) by certain clans or family groups that had been defeated in tribal warfare. Their lands had been taken by others under the sway of Tamatea-ariki, a chief of some importance. Hence the defeated families resolved to construct a vessel for deep-sea voyaging and seek a new home in Aotea-roa, the far-off land discovered by Kupe in former times, the location of which was well known. In old traditions this land was said to be situated at *tiritiri o te moana*, an expression denoting the vast ocean spaces, or remoteness. A tree known as Te Puwhenua was selected wherefrom to fashion a canoe. This was a Maori custom, the assigning of special names to large or otherwise remarkable trees, such as might be used for canoes, or whereon bird-snares were set every season. The tree is said to have been felled by means of digging round its base—a very primitive method. When the hull and other timbers had been dubbed out, they were buried in a large trench dug in the earth, where they remained for months, when they were taken out, placed on platforms, and covered. These processes were for the purpose of seasoning the timbers. When hauled to the coast, the smaller timbers were placed in the hull and there secured, while a long pole was lashed fore and aft on the top of the hull, which pole served as a means of steadying and guiding the hull as it was hauled along over the skids. The hull was in four pieces, butt-joined (*haumi tuporo*)—which fact seems to imply that the timber-trees available were by no means long-barrelled. Another version states that the hull was composed of three pieces. Six *pairi* were hewn out for the vessel. This term *pairi* is explained as another name for the *rauawa*, or side boards. Six of these would mean three on either side; but another version is that "Takitumu" had four *pairi* on each side, which would mean that the dugout hull was but shallow, as was usual in eastern Polynesia. We know *rauawa* and *oa* as Maori names for top-strakes, but *Williams's Maori Dictionary* gives *pairi* as denoting wash boards at the bow of a canoe.

The canoe was then fitted up; the top-strakes, thwarts, and other timbers were fixed and lashed. Another authority says that the vessel had three strakes or tiers of planks on either side. This is quite possible, as shown in the construction of the canoes of Tahiti in Cook's time.

When the vessel was launched on the waters of Pikopiko-i-whiti it was seen that she trimmed well—was in no way lopsided. The prow divided the water well; the water did

not pile up against the cutwater, as it does when that part is not constructed on proper lines. When it was seen that the vessel rode well, a number of canoes assembled for a race on the waters of Pikopiko-i-whiti, which are protected from the ocean by a reef of rock. Among those canoes were "Tainui," "Te Arawa," and "Matatua"; and the people gathered on the hill Puke-hapopo in order to view the race. "Takitumu" turned out to be the swiftest of the canoes, and it was at this time that she was given that name. Soon after this occurrence the "Arawa," "Tainui," "Mamari," "Karaerae," "Horouta," and other vessels left for New Zealand. "Takitumu" left some time later under the chief Tamatea, for he and his friends had managed to gain possession of the vessel. Some of them came hither in her, while those of her rightful owners who came seem to have occupied a subordinate position.

Prior to the final launching of the vessel for her voyage, she was hauled to the *turuma* (latrine) at Titirangi, where certain ritual was recited over the vessel to render her *tapu*, for she was about to be placed under the protection of the gods, and certain objects representing those gods placed on board her. A number of ritual chants were recited by the priests Rua-wharo and Te Rongo-patahi in order to influence winds and ocean currents in favour of the vessel—to calm the ocean and produce favourable conditions generally. The ritual recited over "Takitumu" includes appeals to many gods, and the language employed is of a sacerdotal and archaic nature. It is published in the original in vol. 4 of the *Memoirs of the Polynesian Society*, paraphrases being also given. The true inwardness of all these invocations is that the Maori of former times possessed the greatest faith in the powers of his gods. In any serious undertaking he placed himself unreservedly under the protection of those gods, and believed that no success could be his unless he received their aid. With that aid he believed that he could accomplish anything, and it was this faith that produced the most daring, self-reliant, and resourceful ocean navigators of whom we have any record — the courageous explorers and sea-rovers who broke out innumerable *ara moana*, or sea-roads, and cross-hatched the vast area of the Pacific Ocean with the wake of their swift craft.

When "Takitumu" was ready for sea, Tamatea inquired of the people, "*E hoa ma! No wai te korou tu ki te haere, no wai te korou noho?*" ("O friends! Whose is the desire to go, whose the desire to stay?") Then it was arranged as to who should go to Aotea-roa in "Takitumu," and the symbols of the gods Kahukura, Ruamano, Tuhinapo, Tama-i-waho, Rongomai, Tunui-a-te-ika, and Hine-korako were put on board. All these *atua* (spirit gods) represent celestial phenomena—meteors, the rainbow, &c. The presence of these symbols of the gods, and the recital of ritual invocations over the vessel, rendered it so remarkably *tapu* that no cooked food could be carried on it, inasmuch as that commodity has, in Maori estimation, a most polluting effect. Its presence would cause the gods to abandon the vessel, to withdraw their protection, thus exposing craft and crew to every known mischance, and practically certain destruction. For in the ritual pertaining to such important undertakings as this the Maori addressed invocations to the greatest of all gods, Io, the Supreme Being, to whom the origin of everything is due, to whom no offerings may be made, of whom no symbol may exist.

It seems evident that, as the Maori conception of the Supreme Being was pitched upon a singularly high plane of thought, a condition preserved only by restricting the cult and its ritual to the highest class of priesthood, the people naturally turned to inferior gods with whom they could be on more familiar terms. Of these they might carry about material symbols or representations; to them offerings might be made. They also had *aria*, or visible forms, such as the rainbow, comets, meteors; also more material forms, such as lizards, birds, and fish. The same feeling that prompted the Maori to evolve gods with whom he might come into closer contact is distinctly noticeable in the Christian religion.

In addition to the gods already mentioned, others were placated and induced to assist the voyagers in crossing the ocean on a journey of over two thousand miles. Among

these were Arai-te-uru, Hine-kotea, Hine-makehu, Harua-tai, Hine-korito, and Hine-huru-huru. The first of these is a sea-god, a demon or supernatural being; some at least of the others are personified forms of various natural phenomena. The second, third, and fifth are the fair Moon Maidens. Then, again, the hordes of Tutara-kauika and Te Wehenga-kauki (emblematical names of whales and other ocean monsters) are said to have guided, preceded, followed, and surrounded "Takitumu" as she sailed down the southern seas to the land-head at Aotea-roa. In these old traditions of former happenings we ever find such curious myths as these. Hence we are told how, apart from sailing directions followed for generations, amazing assistance was derived from these supernatural beings: how Kahukura (personified form of rainbow) gleamed in the skies ahead as a guide during the daytime; how at night he returned to the vessel, his place being taken by Hine-korako (personification of some lunar phenomenon); how Ruamano led the vessel, and the ocean hordes acted as guardians on either side, while Harua-tai kept in her wake to ward off all danger from that direction. Little wonder that "Takitumu" safely crossed the rolling breast of Hine-moana and made her landfall under alien skies!

We are told that Te Rongo-patahi, Ruawharo, Tupai, and Kohupara were the *tohunga*, or priestly adepts, who went to the *tapu* cave known as Te Kohurau, where the gods (*i.e.*, the symbols of the gods) were kept, and these were placed on board "Takitumu."

[*Sketch by Miss E. Richardson.*

FIG. 169.—A SPECIMEN OF MAORI ART.

1. Paepae-Aotea. 2. Whakaari. 3. Te Wehenga Kauki. 4. Tutara Kauika. 5. Kohi.

A drawing made by Timi Waata, an elderly native of the Bay of Plenty. It illustrates a local folk-tale. A local chief, Te Tahi, was marooned by enemies on Whakaari (White Island). He called upon the sea monsters for help, and they bore him safely to his home at Whakatane. He is here seen on the back of Tutara Kanika (the right whale), apparently defying and overhauling his enemies, who, in three two-masted canoes, are approaching Kohi Point. The Paepae-Aotea rock has a top-heavy appearance, and White Island is apparently in eruption; the whales are spouting merrily.

Of these gods perhaps Kahukura (a rainbow-god) was deemed the most important, for we are told that "Takitumu" was brought ashore and hauled on to the *turuma* (latrine) of Titirangi, the home of Tamatea at Whangara, in order that Kahukura might embark on her. To induce an *atua* (god) of the standing of Kahukura to take up his quarters on the vessel it was necessary for that vessel to be placed on a *tapu* place, or a place not likely to be desecrated in after-times by careless strollers or carriers of cooked food; and also certain ritual had to be chanted by the priests to locate the gods whose presence was desired at the stern of the vessel. Thus the canoe was hauled up until her stern rested on the *turuma*. Whereas some of the vessels that came to Aotea-roa were *noa* (common, void of *tapu*), "Takitumu" is said to have been a vessel rendered wholly *tapu* from bow to stern, so that no cooked-food supplies could be carried on her, the crew subsisting on dried food products and fish caught at sea during the voyage.

We now meet with a curious account of the treatment of these so-called gods. Although material symbols of these beings appear to have been preserved, and to have been placed on board the vessel, yet they seem to have been viewed essentially as spirit gods; they were confined in vessels specially made for the purpose. In these vessels they were kept confined during the night, but on fine days the vessels were opened to

enable these spiritual guardians to come forth and take the air. Small elevated stages (*kauwhata*) were provided for their accommodation at such times, one for each *atua*. It is not clear as to whether the material symbols of the gods were placed on such platforms or not.

The vessels containing the *atua*, or symbols thereof, are termed *taha rakau*. *Taha* describes a gourd vessel, but these "wooden gourds" were made by carefully shaping, hollowing out, and fitting together two pieces of wood, each forming half a gourd-shaped vessel. Near the edges of each half holes were bored, and through these were passed the cords by which they were lashed together. The join was then covered with a vegetable gum, and the outside of the vessel painted red with ochre; the orifice was provided with a lid or cover.

The persons appointed to serve those *atua*, to attend to them, were Te Rongo-patahi, Rua-wharo, Tupai, Kohupara, Kaewa, Puhi-whanake, Mokinokino, and Whatuira. To these adepts were assigned the two stern thwarts of "Takitumu," the place where the gods were located. Of these adepts, Kohupara and Tupai were the experienced deep-sea navigators, whose knowledge came from the days of the sojourn at Tawhiti-roa, hence the position assigned to them in the vessel. The two thwarts ahead of them were occupied by Tamatea-ariki and his folk.

Kaewa was the bearer and caretaker of the fire-generating implements, the *kaunoti* and *hika*, the special name of the latter being Te Hika puaroa, named after the star called Puaroa, which is a *tapu* star, and the aspect of which resembles the faint wisp of smoke seen when fire is obtained by the *hika* or friction process. The name of the *kaunoti*, or grooved piece, was Te Ra Kura.

Puhi-whanake and Whatuira were the astrologers and weather experts who discerned the signs of stormy and fine weather, who scanned the moon and sun, that the bow of the vessel might be kept directed to the land. They were specially watchful at night, and the stars watched by them as aids to navigation were Atutahi-ma-Rehua, Tautoru, Puanga, Karewa, Takurua, Tawera, Meremere, Matariki, Kopu, Tama-rereti, and Te Ikaroa. These were the stars by means of which "Takitumu" was guided hither from Tawhiti-nui, at Hawaiki.

The special task of Kohupara and Tupai was the care of the gods, lest some of them decamp—the closing of the vessels containing them, and the opening of those vessels in daytime, apart from such times as it might be considered desirable to allow them to roam abroad. With that twain only lay the arranging of such matters.

Mokinokino had the care of the food-supplies for the priestly adepts; he supplied them with food throughout the voyage of "Takitumu" across the ocean, such food-supplies being stored at the bow of the vessel.

Te Rongo-patahi and Rua-wharo were the priests appointed to despatch the gods on any quest or task deemed desirable.

We are told that "Takitumu" was provided with twenty-six thwarts. If this is correct they must have been placed remarkably close together. With his well-known faculty for preserving unimportant details, the Maori has retained the names of most of these thwarts, as also those of many other fittings of the vessel. The name of the principal person or persons of those who occupied each thwart and its attendant space of the hull has also in many cases been remembered.

(1.) Te Ra-kura: This was the name of the thwart nearest the stern of "Takitumu." It was occupied by the three priestly adepts Te Rongo-patahi, Rua-wharo, and Tupai.

(2.) The next thwart was called Te Paerangi.

(3.) The next was Te Paetaku. Tamatea-ariki and his family occupied this part. He was the leader and principal chief.

(4.) The next was Rakau-amoamo; occupied by Kahu-tuanui, Hape-ki-tuarangi, and Taikehu.
(5.) The next was Rakau-whatawhata. Tamatea-kota was the principal person.
(6.) Next was Te Pia-tangi-rere. Tuai-te-rangi and others occupied it.
(7.) Next was Maire-kura; occupied by Kohupara, Mokinokino, and others.
(8.) The next was Te Ata-a-kura.
(9.) Then came Manutahi. These two (8 and 9) were occupied by Tutaka-hinahina, Puhi-whakaawe, Te Rautahi, Mokomoko, and others.
(10.) The next was Maire-hau. Rongo-mahaeata was the principal person.
(11.) The next was Te Puwhenua.
(12.) The next was Paekawa. The principal occupier was Moko-nui-a-rangi.
(13.) Next came Rere-moana. Hautu-te-rangi and others occupied it.
(14.) Then came Tiritiri-o-te-moana.
(15.) Then Ruku-moana; occupied by Rerehu-rangi and others.
(16.) The next was named Aotea-roa.
(17.) The next was Horonuku-atea; held by Te Rangi-katatau and companions.
(18.) The next was Horonuku-rangi; occupied by Ira-kai-putahi and others.
(19.) The next was Ahuahu.
(20.) The next was Maui-taha.
(21.) The next was Maui-pae; occupied by Kaewa and others.

Here we have a list of twenty-one thwart-names given, and are told that the names of five have been forgotten. The names of twenty-two of the crew are included; others are given later on in the narrative.

Men were now selected for various duties to be performed during the voyage. The greater number were paddlers, whose duties not only consisted of propelling the canoe when a sailing-wind failed, but also of a strenuous use of their paddles in a rough sea. Each man was provided with two paddles. At the stern were located resolute adepts to attend to four large oars used in steering and controlling the vessel. Two of these were *hoe whakatere* (steer-oars), the other two were termed *hoe matua.* Other skilful adepts were stationed at the bow to manipulate the long paddles or oars termed *hoe whakaara* and *hoe matua.* The former were used in some way that tended to keep the bow of the vessel up. Other active and practised men were told off to attend to the two sails, the two bailing-wells, and the two anchors, as occasion demanded. The stern sail was named Te Haeata-o-te-rangi; the forward sail was Pari-nui-te-ra. The two ropes of the former were named Tangaengae and Takerekere: of the latter, one rope was Te Aka-rinoi; the name of the other has been forgotten; but the *huapae* (? sprit or boom) of this sail was called Te Pae-taku, while that of the stern sail was Toko-ahuru. The mast had two stays. Each bailing-well (*puna wai*) was provided with wooden bailers, large and small, the larger ones, named Auru-moana and Harewa, being adorned with carving. There was one anchor kept at the bow of the vessel—it was a *punga-korewa,* or sea-anchor; the other, kept at the stern, was a *punga-whakawhenua,* or ground-anchor. The latter was named Horu-moana, being a much heavier anchor than that of the bow. Each anchor had two ropes or cables attached to it: those of Horu-moana were named Marohi and Mawake; those of the small anchor were not named.

Another account states that the two *huapae* of "Takitumu" were named Tatau-urutahi and Tatau-uruora, which are names of two lunar months of the Maori year. It is not clear as to what these *huapae* were. Some apply the term to the fore-and-aft beams or poles of an outrigger, between float and hull. It is really a generic term applied to timbers of many structures, but only, apparently, to timbers in a horizontal position, or nearly so. (*Cf. kurupae, pae, paepae.*) Thus if applied to a sprit or boom of a sail, then that sail must have been a lateen sail. It would not, presumably, be applied to the almost vertical sprit of a *ra kautu,* or upright sail.

This same account says that "Takitumu" had two *toko*, or masts, named Toko-huru-nuku and Toko-huru-rangi. There were two *taura huti* (hoisting-ropes), and four *taura whakahaere* (controlling-ropes): these were evidently for manipulating the sails. Her two *puhi*, or feather decorations, were Puhi-rere and Puhi-whakaawe.

Two *korere* were fixed, one for each side of the canoe. The *korewa* timbers (outrigger floats) were very light timber. The purpose of the *korewa* was to prevent the canoe capsizing, or, in the event of a capsize, to facilitate its being righted by the crew in the water. The *korewa* are said to have been named Paepae-moana, but this has not been verified by the sages of the school of learning.

The above account, given by an old native of much learning in tribal lore, seems to fix *korere* as a name for the outrigger as a whole, *korewa* being applied to the floats. If this is correct, then we kave the statement that "Takitumu" was a double outrigger canoe. The double outrigger seems to be now unknown in Polynesia, but there is some evidence to show that it was formerly employed in that region. Possibly it has given way to the single form in comparatively modern times.

There is a mention of affixing certain parts (presumably planks), alluded to as *paewai* and "coverings of the gunwale," which were probably some form of wash-boards to prevent the surge of waves lapping over the sides of the vessel. In another account we have references to some contrivances, apparently for a similar purpose, termed *taupa karekare wai*, or spray-guard, and *pare arai wai turuturu*. The precise manner in which these planks were fixed is by no means clear, but one is said to have been lashed to the gunwale in such a position as to throw off any wave surging up the side of the vessel. One would suppose that any projecting plank would interfere with the use of paddles; but, unfortunately, we are now unable to obtain explanations of this and some other puzzling features. A similar plan is adopted in the construction of some of our concrete walls in harbour-works.

Another contrivance for the comfort of the crew of "Takitumu," and which seems to have been a common usage with deep-sea voyages, was an awning (called the *mahau*) placed over the canoe. This shelter must have been of the greatest service when bad weather was encountered at sea; it is mentioned in several old narratives, including the voyage of Kahu from Cook Strait to the Chatham Islands. In making this awning, uprights, termed *tokotu*, were fixed to the sides of the canoe, then rods were bent and lashed to these uprights so as to form a series of arches over the hull; these curved rods being known as *whiti*, *torowhiti*, and *whiti tu*. Small, long rods, termed *kaho*, to serve as battens, were lashed in a horizontal position to the curved rods, and over this framework were drawn the *huripoki*, *hipoki*, or *uhirau* (covering-mats). These were either woven mats or sheets of *aute* (bark-cloth of Polynesia). In the tradition of the voyage of Kahu to the Chathams the awning is said to have been made of *koaka*, a name applied to coarse floor-mats made of *Phormium* leaves. These mats or sheets were drawn down the sides in bad weather, and so lashed, thus adding much to the conmfort of the voyagers. In fine weather they are said to have been rolled up.

In one account of "Takitumu" it is said that the sail was provided with two *kaupeka* (yards or sprits), and that certain ropes from the masthead supported the upper *kaupeka*, both of which were attached loosely to the mast, so that the sail could be moved to any desired angle. This looks much like a description of the lateen sail. A further statement, that the sail could be lowered any desired distance by means of a rope, called the *whitirea*, passing through or over the masthead, recalls a Fiji usage.

Three skids, named Te Manu-tawhiorangi, Te Take, and Pakeke-taiari, were carried on "Takitumu." In landing operations the first-named was the first laid down, it being possessed of certain superior powers as a skid, doubtless because some form of ritual had been recited over it.

Owing to the intense *tapu* of "Takitumu," it is said that no supply of cooked food could be carried in her; hence the sea stores consisted of dried foods only, the principal items being dried fish and shell-fish. Water was carried in vessels of various kinds: bags made of seaweed, and wooden vessels, probably of bamboo, were employed.

The other vessels of the fleet are said to have left Hawaiki for New Zealand before "Takitumu," the latter being prevented from sailing for some time by strong westerly winds. The crew came to the conclusion that those who had preceded them had raised the wind by their magic arts, so as to prevent "Takitumu" following them. When the main fleet encountered rough seas the crews made a similar charge against the "Takitumu" folk—so ready is the Maori to ascribe any misfortune to magic.

When "Takitumu" reached Rarotonga it was learned that the other vessels had called there and had left for New Zealand, with the exception of "Aotea," which canoe is not known to have called at that place. When our voyagers arrived at some place in mid-ocean known as Tuahiwi nui o Hine-moana (Great Ridge of Hine-moana) they encountered remarkably rough seas, which are said to be a common feature of that region. Here myth and superstition again enter into the narrative, in the means employed for quelling those rough seas, and so enabling "Takitumu" to proceed in safety. At this serious crisis Te Rongo-patahi and Tupai, two priestly adepts, took charge of the situation. They produced two *tapu* stone adzes named Te Awhio-rangi and Whiro-nui, ceremonial implements employed in certain ritual performances, in which they were "waved" to the gods, much as an offering of food is held out in the hand and waved towards the spirit gods in space. These sacerdotal stone adzes were now employed by the priests to (metaphorically) cut a passage for the vessel through the great waves that are said to have "stood up like cliffs." A long invocation or charm was chanted by the two adepts to calm the raging seas. The performance is stated to have had the desired effect, and our voyagers arrived safely at Whanga-paraoa, on the east coast of the North Island of New Zealand. In a popular account of this voyage, published many years ago, it is stated that the crew suffered great hardships from hunger, but in the genuine tradition as preserved by adepts no mention is made of such hardships.

In making the run from Rarotonga to New Zealand we are told that the bow of the vessel was directed toward the setting sun, moon, and Venus, or just to the left of them. Presumably the voyagers would also steer by observing the wind and the roll of the waves. The dangers of this mode of navigation would be such as those encountered in eastern Polynesia by Whatonga and others, and by Mariner and his companions near the Tongan Group—namely, dense sea-fogs and lack or change of wind.

Our voyagers did not remain at Whanga-paraoa, where they found the crews of "Tainui" and "Te Arawa," for the land was occupied by a numerous people of the Toi tribes, descendants of the aborigines and of previous immigrants from eastern Polynesia. They proceeded in their vessel to the North Cape, thence to Hokianga, where they lived for some time. Leaving there, they returned down the east coast, and went right on to Port Nicholson, then occupied by the Ngai-Tara Tribe. From there they proceeded to the South Island, where most of them settled, and of which they are said to have been the first inhabitants—a statement that may certainly be doubted.

The "Takitumu" canoe is said to have been taken back to the islands by one Taka-ahi—a statement corroborated by Rarotongan tradition; but we know not who his companions were, save that Rongokako was one of them.

In one account of the coming of "Takitumu" it is said that she came down the east coast, her crew being in search of Te Mahia-mai-Tawhiti (north of Hawke's Bay). Having passed Torouka and Te Ika-a-Tauira, they saw Waikawa and Kahutara loom up, when Ruawharo stood up and cried, "This is Te Mahia." As they approached, Nuku-taurua was seen projecting out. Here Rua-wharo and others landed and settled.

They opened up and deposited here some earth or gravel that had been brought from Te Mahia at Tawhiti (Tahiti Isle), and performed some ceremonies. Next morning a whale was seen stranded on the beach. When they left their far-off island home the mother of Rua-wharo had said to him and his brother, "At the place where a whale is cast ashore you two must settle."

"Horouta."

The vessel known as "Horouta" came to New Zealand from Tawhiti (Tahiti) at the same time that those named "Arawa," "Tainui," "Matatua," "Takitumu," and "Aotea" came. Pawa, or Paoa, was the principal man of "Horouta." Ira, eponymic ancestor of Ngati-Ira, also came in that vessel. A list of over seventy persons has been preserved as having come hither in "Horouta." This vessel came to land at Ahuahu, and then coasted down to Ohiwa. These immigrants are said to have introduced the *kuri*, or native dog, as also the *kumara*, or sweet potato.

Yet another vessel that reached these shores from the isles of Polynesia was one commanded by Whiro-te-tipua, who settled at Oakura, Taranaki District, where there is a place named Te Wai-piropiro a Whiro-te-tipua. After his arrival here a party went to attack the Rua-tamore aborigines living at Te Awa-toto, Tuhua district, and these raiders returned with information that there was much unoccupied land inland of Whanga-nui; hence Whiro left Oakura, where he had married a local woman named Tai-te-ariki, and traversed the land as far as Karioi-o-Whiro, eventually settling up the Whanga-nui valley.

List of Canoes that reached New Zealand from the Pacific Isles, as preserved in Maori Tradition.

"Aotea"; "Aotea-roa": Probably the same vessel. Crew settled on west coast of North Island.
"Arai-te-uru": Crew settled in South Island.
"Aratauwhaiti": Said to have been one of the earliest vessels to reach New Zealand.
"Arawa, Te": Crew settled in Bay of Plenty.
"Horouta": Descendants of crew on east coast and in Bay of Plenty.
"Houama, Te": One of Nuku's fleet. Returned to Polynesia.
"Kahutara": One of three vessels in which ancestors of Mouriuri aborigines came.
"Karaerae, Te": Said to have landed at Waipiro.
"Kurahaupo": The vessel of Whatonga, whose descendants occupied the Wellington district.
"Mahuhu": Descendants of crew in North Auckland district.
"Mamari": Descendants of crew in North Auckland district.
"Mapouriki."
"Matahorua": The vessel of Kupe. Returned to Polynesia.
"Matatua": Descendants of crew in Bay of Plenty and far North.
"Nukutere": Crew landed at Waiaua. Descendants in Opotiki district.
"Okoki": Vessel of Mouriuri aborigines.
"Oturereao": Crew settled at Ohiwa.
"Paepae ki Rarotonga": Said to be the canoe of Toi.
"Puketea-wainui": Vessel of Ruaeo. Crew settled in Bay of Plenty.
"Rangiahua."
"Rangi-matoru, Te": Crew settled at Ohiwa.
"Ririno, Te."
"Taikoria": Canoe of Mouriuri aborigines.
"Tainui": Crew settled at Kawhia, &c.
"Takitumu": Crew settled on east coast of North Island and of South Island.

"Tangi-apakura": A double canoe. One of Nuku's fleet. Returned to Polynesia.
"Tawiri-rangi": The vessel of Ngahue, companion of Kupe. Returned to Polynesia.
"Tokomaru": The vessel of Manaia. Crew settled on Taranaki coast.
"Tuwhenua," or "Waka-tuwhenua": Its proper name said to be "Moe-te-kakara," or "Te Riu-kakara."
"Waimate": A double canoe. One of Nuku's fleet. Returned to Polynesia.

In addition to the above list there are many other names of vessels that are said to have reached these shores in past times, but about which little is known, in many cases the name only being preserved. It is quite possible that some of these craft were mere visitors that returned whence they came, manned by adventurous voyagers listing to the lure of the sea and the desire to look upon strange lands. There is much evidence to show that many such voyages were made by Polynesians athwart the Pacific area in former times. We are told in Maori tradition that two voyagers named Maku and Nuku so visited this land, only to return to Polynesia; and elsewhere in these pages the return voyages of Tama-ahua, Tumoana, and Rongo-kako are mentioned.

Tradition states that two vessels named "Punga-a-rangi" and "Whatu-ranganuku" reached this land, but another account has it that these two, as also another called "Whatu-purangi," remained at Rarotonga. In some cases confusion has arisen, as in the cases of "Te Ririno" and "Kura-hau-po." The former is said by some to have reached New Zealand, but another version is that it was lost at sea. One tradition states that the vessel of Toi was "Te Paepae ki Rarotonga," a canoe that is known to the natives of Rarotonga, according to Colonel Gudgeon. The Bay of Plenty natives tell us that a vessel of this name came to land at Tara-o-Muturangi, near Matata. It was under a chief named Waitaha-ariki-kore, and it arrived before "Matatua." (See *Transactions of the New Zealand Institute*, vol. 37, p. 127.) The confusion as to time of arrival also exists in the case of "Kura-hau-po."

Voyages made from New Zealand to Polynesia.

It is apparent that in former times a number of voyages were made from New Zealand to the isles of Polynesia. The movements of the ancestors of the Maori across the Southern Ocean were not confined to the voyages made from the northern islands to New Zealand, for many were made in the opposite direction. Some voyagers to these isles did not remain here, but returned to their far-away homes, as in the cases of Kupe, Ngahue, Nuku, and others already mentioned. We have also seen that the "Takitumu" canoe was taken back to the islands, and that another, named "Te Ara-tawhao," a local vessel, left Whakatane to fetch seed-tubers of the sweet potato from Polynesia. Tama-ahua, who came to these shores in "Kura-hau-po," is also said to have made the voyage back to his former home. The name of the vessel on which Tama-ahua returned to Polynesia was "Te Rona-waiwai." It is said to have belonged to Karanga-hape, one of the Toi folk. Another immigrant, named Tumoana, who had landed at Te Tauroa, in the Ahipara district, settled at Hokianga, but finally returned to Polynesia. One Pou-rangahua is also said to have sailed from the east coast for the same destination, and to have returned here. Rongo-kako, father of Tamatea, the chief man of the immigrant vessel "Takitumu," also returned to Polynesia, and the Maori folk of New Zealand are acquainted with his further adventures after his return there—intelligence that must have been brought by later arrivals.

The Bay of Plenty natives have preserved a tradition that in times long past away a voyager named Tiwakawaka came here from a land named Mataora, in a vessel called "Te Ara-tauwhaiti," and settled at Whakatane. These folk were visited by another voyager, named Maku, who came from Hawaiki, and who returned whence he came. In the time of Rakai-hikuroa, of the east coast, who flourished sixteen generations ago, one Tuwhiri-rau commanded a party that sailed from these shores for Rarotonga. In later times a party under Mou-te-rangi sailed from Whare-kahika, on the east coast of the

North Island, for the isles of Polynesia. From Reporua, on the same coast, yet another company, under a chief named Pahiko, sailed about two hundred and fifty years ago for the same destination. Intertribal warfare was the cause of this venture. This is the most recent case of a voyage from New Zealand to Polynesia that has been fixed. No corroboration has been noted of Thomson's story that a canoe left Tauranga early in the nineteenth century to go in search of Hawaiki, the former home of the Maori, as given in his *Story of New Zealand*. We have no proof that any canoes arrived at or left New Zealand for Polynesia during the past two centuries. The following are Thomson's remarks: "Mr. Hale states that about the year 1740 a party of Polynesians arrived at the Bay of Islands from Hawaiki. . . . Careful personal inquiry, in the year 1850, on the spot where Mr. Hale received his information, enables me to state that he has been misinformed, for no modern migration from Polynesia to New Zealand has occurred. About the year 1830 a canoe load of emigrants sailed from Mayor Island, in the Bay of Plenty, for Hawaiki, and they have never since been heard of." This last statement is, I believe, a doubtful one.

The following note by Colonel Gudgeon is interesting; it appeared in vol. 13 of the *Journal of the Polynesian Society:* "It is a very singular thing that the people of Penrhyn (Tongareva) and Manihiki Islands, lying north of Rarotonga, insist that their ancestors came from Hawaiki-tautau (which is the Rarotongan name for New Zealand). . . . Before the time of Tangiia and Karika, of Rarotonga (*circa* 1250), people came to these northern islands from New Zealand."

Here follow two traditions, collected by the late Mr. John White, of drift voyages from New Zealand to northern isles that occurred at unknown dates:—

Canoe from New Zealand reaches a Distant Inhabited Isle and returns.

In times long past a company of forty men of the Bay of Islands district went out to sea on a fishing excursion. They were caught in a southerly gale and carried far across the ocean. They at length reached an island inhabited by folk who differed from the Maoris. They were an idle, inactive, and unwarlike people. The forty castaways attacked them with their paddles, killed the men, and appropriated the women. There being but one good-looking woman on the isle, the two principal men of the castaways quarrelled over the possession of her. One claimed her because he was older than the other claimant. On consulting their *tohunga* on the subject, he proposed to perform a ceremony of divination in order to decide the matter. He did so, and the result was in favour of the elder man. A few months after, however, the man died, and the younger then took possession of the woman.

The island was a small one, and disturbed at intervals by earthquakes. Food was plentiful, but life on the isle became irksome to the castaways on account of the small area of the place, so unlike Aotea-roa (New Zealand). Hence, after living there for some years, they built four large *ama-tiatia*, or outrigger canoes, and came back to New Zealand, making the land near Whanga-roa, where they settled among their relatives.

A Drift Canoe from New Zealand reaches a Distant Inhabited Island and returns hither.

In times long past away a chief named Marara, of the Hauraki district, with seven companions, went out to sea on a fishing excursion. While on the fishing-ground a gale sprung up, which blew the canoe far out to sea. They were driven for days before the gale, and lived on the fish they had caught on the *hapuku* ground, and rain-water. They were at sea for eighteen days before sighting land, by which time only two men were capable of steering the canoe. On the eighteenth day of their voyage they made land. On landing they were met by a body of natives armed with spears, who came to oppose them. Their spears looked like the stalks of *toetoe kiwi* (*Gahnia lacera*). One of the natives called out to the waifs, "*Na we koutou?*" to which one of the seafarers replied, "*Na te hau i pupuhi mai*" ("The winds blew us hither"). Again the island people asked, "*Na we koutou no te ao rewa?*" to which answer was made "*No toka*"[?].

Question: "*Na we koutou na te ao piki?*" Answer: "*Ana, e ta, tenei.*"

Question: "*Na we koutou na te ao te tauia?*" Answer: "*No toka.*"

Question: "*E kore iana koe e titiro ki to wahine ki a Papa e nanahu na?*" Answer: "*Ana, e ta, tenei.*"

Question: "*E kore iana to aroaro e anga ki te ra?*" Answer: "*Ana, e ta, tenei.*"
Question: "*Na we te pupu?*" Answer: "*Na toka.*"
Question: "*Na we te tawiri?*" Answer: "*Na toka.*"

"*Nau mai ki uta, ko hui te rangiora, he ora.*" The party were then allowed to land, and the strongest man of the party procured some water and therewith wet the lips of his companions as they lay in the canoe. Then the weaker ones were carried ashore, and some of the fish they had dried during the voyage was cooked. The two men of the party who were still able to move about busied themselves in looking after their companions. They found the *kumara* (sweet potato) growing wild in the low, moist parts of the valleys. All this time the people of the land were sitting in groups watching the ocean waifs. When the castaways kindled a fire and proceeded to cook food the natives of the place made strong objections to the kumara being cooked at a fire. However, the castaways persisted in so cooking it, and the party of eight men gradually recovered.

The daughter of the chief who had questioned the waifs when they landed was given as a wife to Marara. The party lived in that land for some time, and spent much of their time in making *kao kumara* for future use. The stone of that land was pumicestone.

All the *kao kumara* (dried sweet potatoes) made was packed in small baskets and carefully covered with dry leaves and grass in order to preserve it from the damp.

Their canoe was a large double one, termed a *huhunu*, with a *komaru*, or sail, made of matting. This vessel they prepared for sea, and stowed in it a quantity of fresh water contained in calabashes. Marara got his companions to place all food-supplies in the canoe, and, at a convenient time, anchor it off-shore. The night before the voyage homeward was commenced all Marara's companions slept on board the canoe. At dawn of day Marara and his wife came down to the beach, where they stood talking for a while. Meanwhile the anchor had been hauled up by Marara's companions, who brought the canoe in close to the beach. Marara now suddenly jumped into the canoe, which at once put off from the shore. His wife now saw that Marara was deserting her, and entreated him to take her with him, but he refused to do so. And so, leaving the woman wailing on the beach, the canoe of the waifs passed out on to the ocean and commenced the long voyage to the far south.

As the canoe passed out to sea her occupants looked back and saw the deserted wife clamber up to the summit of a high cliff near the beach. There she stood for a while waving her garment in token of farewell. Then, as they looked, they saw the hapless woman throw herself from the cliff-head upon the rocks far below.

The tradition states that the voyage back to Aotea-roa, or New Zealand, was made principally under sail, steering by the stars at night. They made the land in the north, and saw the ranges near the Bay of Islands and to the south as their first glimpse of the homeland after a three years' absence.

They now ran down the coast and reached their home in the Hauraki district at night. Marara at once went to his own home, where he had left his wife and little child three years before. He found his child, a boy, outside the house, weeping. On being questioned, the child said that his mother's new husband had beaten him and turned him out of the house; also that his own father had been drowned at sea when out fishing. Marara told the boy to pull aside the door of the house and tell his persecutor that if he beat him again he would be fed to the dogs. The child was at first afraid to do so, but was at length persuaded by Marara, who promised to protect him. On hearing the remark the enraged man came forth to chastise the child, and, as he passed through the low doorway in a stooping position, Marara struck him on the head with his *mere paraoa* and killed him. His body was not, however, consigned to the dogs, but was placed with the dead of the tribe. And Marara regained his wife and child, and related his adventures during his three years' absence.

The dialogue given above contains curious expressions and is untranslatable. It may have suffered through being handed down for generations.

The Legend of Werohia and the Cannibal Folk.

This is another tradition collected by the late Mr. John White; it was recited by a member of the Ngati-Mahuta Tribe many years ago:—

A chief of olden times named Puni had two sons, Werohia and Raho-punga. Werohia, the elder brother, was trained in the arts of war, while his brother was taught the learning of his father, who was a *tohunga* (priestly adept). When Werohia was trained to the use of arms his father challenged him to fight, that he might see his proficiency; and so clever was the son in the use of his weapon that he slew his father. Now, these brothers heard reports concerning a people

of evil habits, a cannibal folk, who lived in a distant land. They resolved to go and attack those people; so they went into the forest, felled a tree, and hewed out a canoe. They selected a crew of fifty men, and sailed for the home of the cannibal people, which was an island far away across the ocean. They steered by the sun in the daytime and the stars at night. On reaching the island the voyagers were met on the beach by some of the cannibals, whom they attacked and dispersed. Other actions were fought, and the raiders were again victors, after which the cannibal chief sued for peace, which was granted by Werohia. Then that chief gave his daughter as a wife for Raho-punga, brother of Werohia.

Some time afterwards the cannibal chief said to his daughter, "O girl, will you not ask your husband by what means his brother may be killed?" The woman replied, "Yes, I will inquire." So that night she said to Raho-punga, "By what means could your elder brother be slain?" And he replied, "It might be done, but this must not be repeated by you to any person." The woman said, "I will not speak of it." Then said her husband, "If he be pelted with stones he may be slain." "Indeed?" "Yes, indeed."

Next morning the wife set off in search of her father, and said to him, "The brother of Werohia says that if he be pelted with stones he cannot escape death." The father remarked, "What is that you say?" "I say that my husband states that stones are the only weapon that Werohia can be slain by—to be thrown at him."

It fell upon a certain day that the cannibal folk attacked the party of Werohia, and when he appeared at the head of his men he was pelted with stones and so killed, together with all his companions, except Raho-punga. The body of Werohia was placed in a basket and suspended to the roof of a house, the while his brother mourned his death. Two old women remained in the house to guard the body. When night came Raho-punga bethought him of trying the powers of certain spells or magic arts taught him by his father, Puni. So he went and stood outside the house where the body of Werohia was suspended, and there repeated a charm. As he ceased the voice of Werohia was heard: "I am Werohia, O Raho-punga!" Thus it was known that Werohia had regained life. And the old women, guardians of the dead, trembled as they heard the voice of the dead. In the morning the old women called upon the people to assemble, when they called to them, "O people! Bow down your heads, that Werohia may be taken down to be eaten." Then, as the people bowed their heads, Werohia leaped down from his basket, seized his weapon, and slew all those cannibal folk, not one of whom escaped except the two old women, whose lives were spared.

Now, the first two of these legends may be genuine traditions of drift voyages from New Zealand that occurred in former times, for we know that a great number of such voyages have occurred in the Pacific. But the story of Werohia is of a very different type, and reads like a vague myth. The idea of a Maori people being shocked at the custom of cannibalism is decidedly novel. The curious account of the vulnerability of the hero takes us back to the myth of Achilles; it is a type of myth encountered in many lands. It is highly probable that this is an introduced legend or myth, brought hither from other lands, and not a remembrance of a genuine voyage made from these shores.

APPENDIX I.

NAMES OF PARTS OF MAORI CANOES, AND OF OBJECTS, ETC., PERTAINING THERETO.

Ahipua . . Fireplace in a canoe. See *pakaiahi.*

Ama . . . . . 1. Outrigger. Syn. *amatiatia, korewa.* 2. Thwart. Syn. *kiato, keretu, taumanu, tauare, tauware. Waka ama* = outrigger canoe.

Amatiatia . . . . 1. Outrigger. 2. Canoe with outrigger

Aohamo . . . . A V-shaped piece of wood joining the sides and forming bow of canoe.

Arakauniho . . . . Bottom edge of top-strake.

Aroaro . . . . Slot or mortise of *haumi* join.

Aronui . . . . To sail directly before the wind.

Aukaha . . . . Lashings by which top-strakes, &c., are secured.

Aupounamu . . . . Extreme end of bow of a *waka taua.*

Awa . . . . . Topsides of canoe. Syn. *rauawa.*

Awarua . . . . Space between thwarts where mast is stepped.

Haumi . . . . Attached piece by means of which the hull of a canoe is lengthened. See *waka haumi, putara.*

Haumi kokomo . . . . A *haumi* fitted to hull by means of mortise and tenon.

Haumi tauaro . . . . Stern *haumi.*

Haumi tuporo . . . . A *haumi* fitted to central part of hull by means of a butt join. See *poro-harore.*

Henga . . . . Upper edge or gunwale of sides of a canoe on which top-strake is secured. The true gunwale or upper edge of top-strake is the *niao.*

Herepuru . . . . Caulking-material.

Hihi . . . . . Curved wands or rods projecting from prow of a *waka taua.* Syn. *ihiihi.* See *taroro, waka taroro, patungaro, karu atua.*

Hipoki . . . . Awning-mats. Syn. *huripoki.*

Hirau . . . . A paddle. The usual term is *hoe.* See *hoe, urunga, urungi, hiwa.*

Hiwa . . . . Steering-oar.

Hiwi . . . . . Hull of a canoe. See *kaunoti, kaunaroa.*

Hoe . . . . . A paddle. Also the verb "to paddle." See *hirau, hiwa, urunga, urungi,* &c.

Hoe matua . . . . A long controlling-oar.

Hoe piripiri . . . . Additional steer-oar.

Hoe tairanga . . . . (?).

Hoe takaki . . . . Paddle having a straight handle.

Hoewai . . . . A broad-bladed paddle.

Hoe whakaara . . . . Long paddles used as oars at the bow for the purpose of controlling the canoe.

Hoe whakahaere . . Steer-oars.

Hoe whakatere . . . . Steer-oars.

Hoe whakaumu . . (?).

Hokai . . . . 1. Booms of outrigger. Syn. *kiato, toro.* 2. Braces placed between double canoes.

Hourua . . . . A double canoe—*waka hourua.*

Huaki . . . . (?) Inward-looking figure on figurehead of a *waka taua.*

Huapae . . . . 1. Longitudinal spars of outrigger-frame. 2. *Nga rakau huapae o te ra.*

Huhunu . . . . 1. Double canoe. See *unua, taurua, mahanga, waka hourua.* 2. Temporary fore wash-strake. Syn. *hunua.*

Hune . . . . Caulking-material (pappus of seeds of *Typha angustifolia*). Syn. *tahune, tahuna, tahunga.*

Hunua .. .. A double canoe.
Huripoki .. .. See *hipoki, uhirau.*
Ihiihi .. .. See *hihi, taroro.* The flat ornament at the end of a *hihi* is the *patungaro.*
Ihu .. .. .. Bow of a canoe.
Kaho .. .. 1. Longitudinal battens on framework of awning. 2. Generic term for battens covering join of top-strake. See *taka, paewai.*
Kahupapa .. .. A raft. See *moki, mokihi, manaia.*
Kaiahi .. .. Longitudinal pieces to which flooring of canoe is attached.
Kaipuke .. .. European ships so termed. See *puke, tuwhenua.*
Kaiwae .. .. Grating or floor in canoe. Syn. *raho, rahoraho, koraho.*
Kakariki .. .. "*Kua piri te kakariki o te niao.*"
Kaokao .. .. Sides of hull of canoe.
Kapuku .. .. Gunwale. Syn. *kopuku.*
Karaho .. .. Floor of a canoe.
Karawhi .. .. (?) A form of boat-rib.
Karemu .. .. Plug in *kowhao* or hole in bottom of a canoe. Syn. *puru, koremu.*
Katea .. . Some form of brace in a canoe.
Kauawhi .. .. (?) Battens of awning roof.
Kauheka .. .. (?) Fore-and-aft gangway-plank on deep-sea outrigger canoe.
Kauhora takapau .. (?) Awning-mats.
Kauhua .. .. } String-piece supporting the *koraho*, or floor. See *whakawahine.*
Kauhuahua .. .. }
Kaunaroa .. .. Main or central part of hull, not including *haumi.* See *hiwi, kaunoti, kotore-puni.*
Kaunoti .. .. Hull of a canoe, minus top-strakes. Syn. *hiwi.*
Kaupapa .. .. 1. Platform between double canoes. 2. Fleet of canoes. 3. Raft.
Kaupeka .. .. (?) Sprit or boom. (?) Yard and boom of lateen sail.
Kei .. .. .. Stern of a canoe. Syn. *noko, ta.*
Keretu .. .. Thwart of a canoe. Syn. *taumanu, ama, kiato, tauware, tauare.*
Kiato .. .. Thwart. For synonyms see *keretu.*
Kihau .. .. Sprit of sail.
Kiko, Whakakiko .. A plug-like patch.
Kohiwi .. .. Body of a canoe without attached parts.
Koki .. . .. Small canoe of the *tiwai* class.
Komaru . .. Sail. Syn. *ra, mamaru, whakawhiti, whara, ra whara.*
Koneke .. .. Carved design on bow of hull, underneath. See *toiere, parata.*
Konia . .. A small canoe.
Kopako . .. A canoe with figurehead facing inwards.
Kopapa .. .. 1. Small canoe of *tiwai* class. 2. Surf-board.
Kopiri .. .. A small canoe.
Koraho . .. Floor-grating of canoe. See *kaiwae, karaho.*
Korari . .. A rude Moriori vessel. Syn. *waka puhara.*
Korea .. .. Small canoe of *tiwai* class. See *koki, konia, kopapa, tiwai, koreti,* &c.
Korehe . .. A small canoe.
Korere .. .. (?) Outrigger. "*Ka meatia nga korere e rua, kotahi mo tetahi taha, kotahi mo tetahi taha o te waka. Ko nga rakau korewa, he rakau mama rawa.*" ("The *korere* were then manipulated, or fixed, one on either side of the canoe. The float timbers were very light wood.")
Koreti .. .. A small canoe.
Korewa .. .. Outrigger. See also *punga korewa, ama.*
Korua .. .. A canoe-name.
Koruru .. .. A style of carving employed on *taurapa* (stern-pieces).
Kotokoto .. .. Sprit of a sail. Syn. *takotokoto, tatakoto, titoko.*
Kotore-puni .. .. Canoe-hull in one piece.
Kou .. .. .. Bunch of feathers on stern-piece. See *puhi*
Koua .. .. Stern-piece of Moriori canoe, Chatham Isles.
Kowhao .. . } Holes pierced for lashings of top-strake, &c. See *aukaha.*
Kowhao matapupuni .. }
Kuru .. .. Tenon of *haumi* join (*haumi kokomo*). Syn. *ure.*
Kuwha .. .. Wings of a *haumi* mortise. Syn. *paihau.* See *kuru, ure.*
Mahanga .. .. A double canoe. See *huhunu, taurua, unua, waka, hourua, unuku.*
Mahau .. .. Awning over canoe used on deep-sea voyages.

Māhē .. .. Sea-anchor; a small stone anchor. See *punga korewa.*
Mamaru .. .. A canoe-sail. See *ra, ra kautu, ra kaupaparu, ra whara, whara, whaka-whiti, komaru.*
Manaia .. .. 1. A carved design on top-strakes. 2. A raft.
Marohi .. .. A single canoe—*waka marohi.*
Matangirua .. .. Denotes sailing and paddling at same time.
Matatara .. .. (?) Prow of canoe-hull. "*Ko te parata kei runga tonu i te matatara o te tinana ake o te waka.*"
Matua .. .. Main part of hull.
Matutu .. .. Some part of the *tauihu.*
Mimiro .. .. *Cf. mimira* in *Williams's Maori Dictionary,* 5th ed. Syn. *tanekaha.* An implement used to tighten lashings.
Moki .. .. 1. Float; raft; rude float in form of canoe. 2. Surf-board.
Mokihi .. .. Syn. *moki.*
Motumotu-toroa .. (?).
Motu tawhiti .. .. European ship.
Neke .. .. .. Skid used in hauling canoes. Syn. *rango.*
Ngaro .. .. A skid. Syn. *rango, neke.* See *neke.*
Ngongo .. .. Implies sailing close to the wind.
Ngongohau .. .. Bow of a canoe.
Niao .. .. .. Gunwale of a canoe.
Noko .. .. .. Stern of a canoe. Syn. *kei, ta, paremata.*
Otu .. .. .. Part of the *pitau* or *taurapa.*
Oa .. .. .. Top-strakes as detached timbers. See *rauoa, owa, awa, rauawa, pairi.*
Owa .. .. .. 1. Thwart. 2. Top-strake.
Pae .. .. .. Transverse supports of the floor of a canoe.
Paemanu .. .. Thwart.
Paewai .. .. Inner batten covering join of top-strake. See *taka.*
Pahi .. .. .. A large seagoing canoe. See also *waka pahi.*
Pahua .. .. Top-strake (Rev. R. Taylor. No corroboration). Syn. *tiwai.*
Paihau .. .. Wings of *haumi* mortise. Syn. *kuwha.* See *kuru, ure.*
Pairi .. .. 1. Fore wash-strake (*Williams's Maori Dictionary*). 2. Strake. "*Ko nga pairi, ara rauawa, e wha i tetahi taha, e wha i tetahi taha, ka waru ai*" (from "Story of Takitumu").
Pakipaki o te ra .. Ornamental border on top of sail.
Pakaiahi .. .. Fireplace in a canoe. See *ahipua.*
Pakoko .. .. Plain figurehead facing inwards. See *whakaanga.*
Pakokori .. .. Deck-house of a large (? double) canoe.
Pakura .. .. 1. A pattern of carving on top-strakes. 2. Projecting edge of top-strake.
Pakurukuru .. .. Plain figurehead of *waka tete.* Syn. *tete, pakoko.*
Panoho .. .. Punting-pole. Syn. *toko.*
Papa-ara .. .. Some part of a canoe.
Papa kai ra .. .. Outer surface of side of canoe.
Papatahi .. .. Single canoe. See *marohi.*
Papatai .. .. 1. (?) Caulking-material of *Typha* leaves used in joins (J. White). 2. Outer surface of fore part of a canoe.
Papawai .. .. Outer surface of bottom of canoe.
Parata .. .. Carved design on under-side of prow. See *toiere, koneke.*
Pare arai wai parati .. } Apparently some form of wash-strake or water-fender on a deep-sea canoe.
Pare arai wai turuturu .. } See *pare-ngaru, pairi.*
Paremata .. .. Stern of a vessel. See *kei, ta.*
Pare-ngaru .. .. 1. Wash-strakes. 2. Upright part of figurehead of a *waka tete.*
Parerua .. .. Having two masts and sails. See *pererua.*
Paretai .. .. Washboard.
Pātū .. .. .. Piece of wood at bow to which ends of top-strakes were secured.
Patua .. .. Syn. *tiwai.*
Pawai .. .. Bilge of a canoe.
Pepe .. .. .. Largest form of Moriori floats or raft canoes of Chatham Isles. Syn. *waka pahi.*
Pere .. .. .. Sail.
Pererua .. .. Canoe with two sails. *Cf. parerua.*
Pinaku .. .. A *waka taua,* or war-canoe. See *pitau.*

Pitau .. .. Williams gives—1. Perforated carving. 2. Figurehead of a canoe ornamented with perforated carving. 3. War-canoe with a figurehead representing the whole human figure. Also (apparently) 4. The scroll in carvings.

Pitau whakareia .. Figurehead of a canoe with arms turned backwards.

Pokai .. .. Battens covering joints (R. H. Matthews).

Pokinikini .. .. Carved design on end of paddle-handle.

Pora .. .. .. 1. A large seagoing canoe. 2. European ships. See *puke, kaipuke.*

Porea .. .. Canoe. See *korea.*

Poro-harore .. .. Butt join of *haumi.* See *haumi tuporo.*

Potikitiki .. .. Small grotesque human figures in canoe-carvings.

Poupou .. .. Shrouds of a canoe-mast.

Puhau .. .. (?)

Puhi .. .. .. Feather ornaments. *Putoi* = single small bunch of feathers. *Puhipuhi* = a number of *putoi* tied together. When used for this purpose the webs are stripped from the shaft adhering to a portion of the rachis, which is flexible. Thus rigidity is avoided when the *putoi* are formed.

Puhi ariki .. ..
Puhi kai ariki .. } Feather ornaments on upper part of *taurapa.*

Puhi moana ariki .. Feather ornaments on lower part of *taurapa.*

Puhi potae .. .. Feather ornaments on *taurapa* (stern-piece).

Puhi rere .. .. Feather ornaments on *taurapa.*

Puhoro .. .. A painted design on under-part of prow of canoe.

Puke .. .. .. 1. European ship. See *kaipuke, tuwhenua, pora.* 2. Denotes large canoe at some Pacific isles.

Punake .. .. Fore part of hull of canoe.

Puna wai .. .. Bailing-place; hole in floor-grating. See *taingawai, taingariu.*

Puneke .. .. (?)

Punga .. .. Anchor.

Punga karewa .. ..
Punga korewa .. .. } Sea-anchor—the smaller stone anchor. See *mahe, punga tarere.*

Punga kowhao .. .. Stone anchor, pierced for cable attachment.

Punga tarere .. .. Sea-anchor. See *punga korewa.*

Punga taupuru ..
Punga whakawhenua .. } Heavy ground-anchor.

Punga terewai .. .. Sounding-weight. Syn. *punga tara.*

Puraho .. .. Open part of *taurapa.*

Puremu .. .. Projecting timbers of Moriori canoe.

Purengi .. .. Stay of a mast. Syn. *puwhenua.*

Purere .. .. Tufts of feathers on battens of top-strakes.

Puru .. .. .. Plug in bottom of canoe. Syn. *karemu.*

Purupuru .. .. 1. Caulking-tool. Syn. *turu.* 2. Caulking-material.

Putara .. .. *Haumi* attached at forward end of hull.

Putere .. .. A raft.

Putiki .. .. The *maunga taura,* a projecting piece of wood in bottom of forward hold, left when hollowing out canoe as a place to attach hauling-ropes to.

Puwhenua .. .. Stay of a mast. Syn. *purengi.*

Ra .. .. .. Sail of a canoe. Syn. *komaru, mamaru, whakawhiti, whara.*

Ra kaupaparu .. .. Lateen sail, rigged with mast, sprit, and boom.

Ra kautu .. .. Upright triangular sail, attached to mast and sprit.

Ra poto whaiti .. Syn. *Ra turuturu matua.*

Ra tauaki .. .. Smaller after-sail of a *parerua.*

Ra tiaka (tianga) .. Mat sail. (South Island.)

Ra turuturu matua .. Mainsail. The largest sail of a *parerua,* forward of *ra tauaki.*

Ra whara .. .. Sail of canoe.

Raho .. .. .. }
Rahoraho .. .. } The floor-grating of a canoe. Syn. *koraho, kaiwae.*

Raiawa .. .. Syn. *rauawa.*

Rakau .. .. Mast of a canoe. Syn. *rewa, tira, tiratu, toko, tokotu.*

Rango .. .. Skid used in hauling canoe. Syn. *ngaro, neke.*

Rapa .. .. Stern-piece. Syn. *taurapa.*

Rauawa .. .. Top-strake. See *awa, rauoa, pahua, pairi, oa, pare.*

Raumutu .. .. Upper edge of top-strake.
Rauoa .. .. Top-strake in position.
Rau tawake .. .. Piece of wood inserted to stop a hole; a patch. *Tawake* = To repair a hole in a canoe. *Tapi* = To patch or mend, as a canoe.
Remu .. .. Space in canoe forward of thwart farthest aft.
Rere paepae .. .. To sail before the wind, but a little off.
Reti .. .. .. A small canoe.
Rewa .. .. Mast of a canoe. Syn. *tira, tiratu, rakau, tokotu.*
Rikomako .. .. Lashings of top-strake.
Ringawhiu .. .. Figurehead having arms extended backwards.
Riu .. .. .. Hold of a canoe. *Riu o Tane-mahuta* = a figurative term for a canoe.
Rongokere .. .. Main part of hull. Syn. *tahiwi, hiwi, kaunoti.*
Ta .. .. .. 1. Stern of a canoe. Syn. *kei, noko.* See *paremata.* 2. Bailer. Syn. *tata, tiheru.*
Tahatu .. .. Upper end of a sail.
Tahuna .. ..
Tahunga .. .. } Caulking-material (pappus of seeds of *Typha angustifolia*). Syn. *hune.*
Tahune .. ..
Taingariu .. ..
Taingawai .. .. } Bailing-place in a canoe. Syn. *puna wai.*
Taitua .. .. 1. Space between thwarts. See *whariu, tauware, wa patiki.* 2. "*Ahakoa kua horo nga rauawa kei raro, me nga taka, me nga taitua,*" &c.
Taka .. .. Outer batten covering join of top-strake. See *paewai, pokai, tokai, kaho.*
Takaki .. .. Paddle having a straight handle—*hoe takaki.*
Takaore .. .. A rope cringle or ring used as a step or containing-agent for certain spars. Syn. *takauru.*
Takere .. .. Keel of a canoe. Syn. *tangere.*
Taketake .. .. Lower end of a sail.
Takiato .. .. Cross-supports for the *raho.*
Takotokoto .. .. Sprit of a sail. Syn. *titoko, tatakoto, kotokoto.*
Taku .. .. Gunwale.
Tanekaha .. .. Implement for tightening lashings. Syn. *mimiro.*
Tangere .. .. Keel of a canoe. Syn. *takere.*
Tao waka .. .. Ballast; lading.
Tararo .. .. Canoe adorned with plumes, carving, &c.
Taratahi .. .. A single canoe. (South Island.)
Taroro .. .. Possibly another name for the *hihi* of a superior canoe.
Tātā .. .. .. A bailer. Syn. *tiheru.*
Tata tarawai .. .. (?)
Tatakoto .. .. Sprit of a sail. Syn. *titoko, kotokoto, takotokoto.*
Tauare .. .. Thwart. Syn. *tauware, taumanu, keretu, ama, kiato.*
Tauihu .. .. Figurehead or prow-piece of a canoe.
Taumanu .. .. Thwart. Syn. *tauware, tauare, keretu, ama, kiato.*
Taumua .. .. The fore *haumi.*
Taupa karekare wai .. Some form of wash-strake or water-fender rigged on deep-sea vessels.
Taupopoki .. . Some part of fore end of canoe.
Taura ripi .. . Said to be the name of a rope used in manipulating outrigger. (No corroboration.)
Taura whakaara .. Forestay. See *purengi, puwhenua, waewae, tukuroa.*
Taurapa .. .. Stern-piece of a canoe.
Tauroto .. .. Stern-piece of a canoe.
Tauru .. .. A skid. Syn. *neke.*
Taurua .. .. Double canoe. Perhaps only applied to a temporary joining of two canoes. See *huhumu, mahanga, unua, unuku, waka hourua.*
Tauware .. .. 1. Thwart. See *taumanu.* 2. Space between thwarts. See *whariu, wa patiki, taitua.*
Ta wai .. .. Bailer.
Tawai .. .. Syn. *tiwai.*
Tawe .. .. Weight on a cable.
Tawharau .. .. Canoe-shed.
Teke .. .. .. Some part of the stern of a canoe.
Tete .. .. . 1. A plain figurehead. See *waka tete.* 2. (?) A design in carving.
Tiheru .. . A bailer. Syn. *tata.*

Tira .. .. .. Mast. Syn. *tiratu, rewa, rakau.*
Tiratu .. .. Mast.
Titoko .. .. Sprit of sail. Syn. *tatakoto, kotokoto, takotokoto.*
Tiwai .. .. Hull of a canoe. See *waka tiwai.*
Toiera .. .. A carved design on figurehead (according to Mohi Turei).
Toiere .. .. Design carved on under-part of prow. Syn. *koneke, parata.* See *waka toiere.*
Tōkai .. .. Uprights in canoe supporting the *kauhuahua*, on which the floor rests.
Toko .. .. .. Mast or sprit.
Toko .. .. .. Punting-pole. Syn. *panoho.*
Tokotu .. .. 1. Masts. 2. Stanchions of *mahau.*
Toro .. .. .. Boom of outrigger. Syn. *hokai.*
Torowhiti .. .. Cross-rods of awning-roof. Syn. *whiti, whiti-tu.*
Tuangi .. .. Projecting upper part of top-strake.
Tuataka .. .. Batten over join of top-strake.
Tuki .. .. .. A canoe having no figurehead or stern-piece, according to one authority. Mohi Turei seems to apply it to a first-class canoe.
Tukuroa .. .. Backstay. See *taura whakaara, purengi, puwhenua, waewae.*
Tungauru .. .. Platform at stern used as a seat.
Tupa .. .. Pads of *raupo (Typha)* on joins of figurehead.
Turu .. .. Caulking-tool. Syn. *purupuru.*
Turuturu kauawhi .. (?) Brace or rib inside canoe.
Tuwhenua .. .. European ships so termed. See *puke, kaipuke.* Said to be the name of some ancient form of vessel known to Maori (doubtful).
Uhirau .. .. Covering-mats of awning. See *huripoki.*
Unua .. .. A double canoe—*waka unua.* See *huhunu, mahanga, taurua, waka hourua.*
Unuku .. .. A double canoe.
Ure .. .. .. Tenon of *haumi* join. Syn. *kuru.*
Urunga .. } Steer-oar. Syn. *hoe whakatere.*
Urungi .. }
Utuutu matua .. .. Bailing-well.
Waewae .. .. Shrouds of mast. See *purengi, puwhenua, taura whakaara, tukuroa.*
Waha .. .. Sheet of a sail.
Waihape .. } To beat against the wind.
Waihapehape .. }
Waka .. .. Canoe ; also trough, box, &c.
Waka ama .. .. Outrigger canoe.
Waka haumi .. .. 1. A canoe the hull of which is formed of more than one piece. See *kotore-puni.* 2. Tender ; canoe used for carrying sea-stores.
Waka hourua .. .. A double canoe. See *huhunu, mahanga, taurua, unua, unuku.*
Waka koporo .. .. Canoe with square cut-off stern.
Waka mamae .. .. Canoe employed in an expedition of blood vengeance, or a canoe of a chief broken up at his death, part of which would probably be used as a mortuary memorial.
Waka maori .. .. Native canoe.
Waka marohi .. .. Single canoe. See *papatahi.*
Waka pahi .. .. A form of the curious Moriori canoe-like floats. See *korari, waka puhara, waka ra, waka rimu.*
Waka pakoko .. .. A canoe with figurehead on which the carved head faced inwards. See *pakoko, whakaanga.*
Waka pitau .. .. A superior canoe. See under *pitau.*
Waka puhara .. .. One form of Moriori canoes (so called) of Chatham Isles. Syn. *korari.* See *waka ra, waka rimu.*
Waka ra .. .. A form of Moriori canoe.
Waka rimu .. .. A Moriori form.
Waka taroro .. .. Applied by Mohi Turei to a high-class canoe, apparently because adorned with a *taroro.*
Waka taua .. .. War-canoe ; superior type.
Waka tete .. .. Second-class canoe, with plain figurehead.
Waka tiwai .. .. Third-class canoe ; a small type, having no top-strakes or ornamental work.
Waka toiera .. .. According to Mohi Turei, a canoe of *waka taua* class having the *toiera* design or style of carving on its figurehead. *Cf. toiere.*
Waka toiere .. .. A canoe having a *toiere* carved on its prow.

Waka tokau .. .. }
Waka totokau .. .. } A canoe without adornment such as carved attachments.
Waka unua .. .. Double canoe. See *huhunu, mahanga, taurua, unua, unuku, waka hourua.*
Waka whakarei .. A superior canoe adorned with carved designs.
Waka whakarei papatahi A single canoe so adorned.
Waka whakarei unua .. A double canoe so adorned.
Wa patiki .. .. Space between thwarts. Perhaps applied to any enclosed or confined space. See *taitua, tauware, whariu.*
Whakaanga .. .. Inward-facing figure of figurehead. See *pakoko.*
Whakaheke .. .. To sail directly before the wind. See *aronui, rere paepae, waihape.*
Whakakiko .. .. Patch on a canoe, let in like a plug. See *rau tawake.*
Whakaparata .. .. Lower part of figurehead resting on *parata.*
Whakarei .. .. Williams gives—1. Carved work at the head and stern of a canoe. 2. Canoe with elaborately carved figurehead, bust, and arms. See *waka whakarei.*
Whakareia .. .. See *pitau whakareia.*
Whakawahine .. .. Apparently another name for the *kauhua.*
Whakawhiti .. .. Sail of a canoe. See *komaru, mamaru, ra, whara.*
Whara .. .. A pad of *raupo* leaves covering join of top-strake.
Whara .. .. Sail of a canoe. See *komaru, mamaru, ra, whakawhiti.*
Whariu .. .. Space between thwarts. See *taitua, tauware, wa patiki.*
Whiti .. .. } Rods secured to uprights and extending across canoe as support for awning. See *torowhiti.*
Whiti-tu .. }
Whitirea .. .. A rope used in manipulating a sail, probably the lateen sail.

The following have been culled from *Williams's Maori Dictionary* :—

Hao .. .. .. To steer a canoe to starboard.
Hoe waka .. .. Denotes the crew of a canoe.
Hukere .. .. To paddle with vigorous strokes.
Iho .. .. .. The principal person in a canoe.
Kaihautu .. .. } Fugleman of a canoe.
Kaituki .. .. }
Kake .. .. To beat to windward in sailing.
Kaumoana .. .. A mariner—member of a crew.
Korope .. .. To turn a canoe by using the paddle at the stern, reaching out and drawing the paddle towards the side.
Rautu .. .. Denotes a sharp keel.
Tapuaka .. .. A knot for holding the anchor of a canoe ; a clove hitch secured by knotting the ends over a rod used for lifting the anchor.
Tirau .. .. To draw a canoe sideways with the paddle.
Tititai .. Fugleman of a canoe.
Whakairi matamata .. To keep a canoe head to the wind.
Whakakake .. To beat to windward in sailing.

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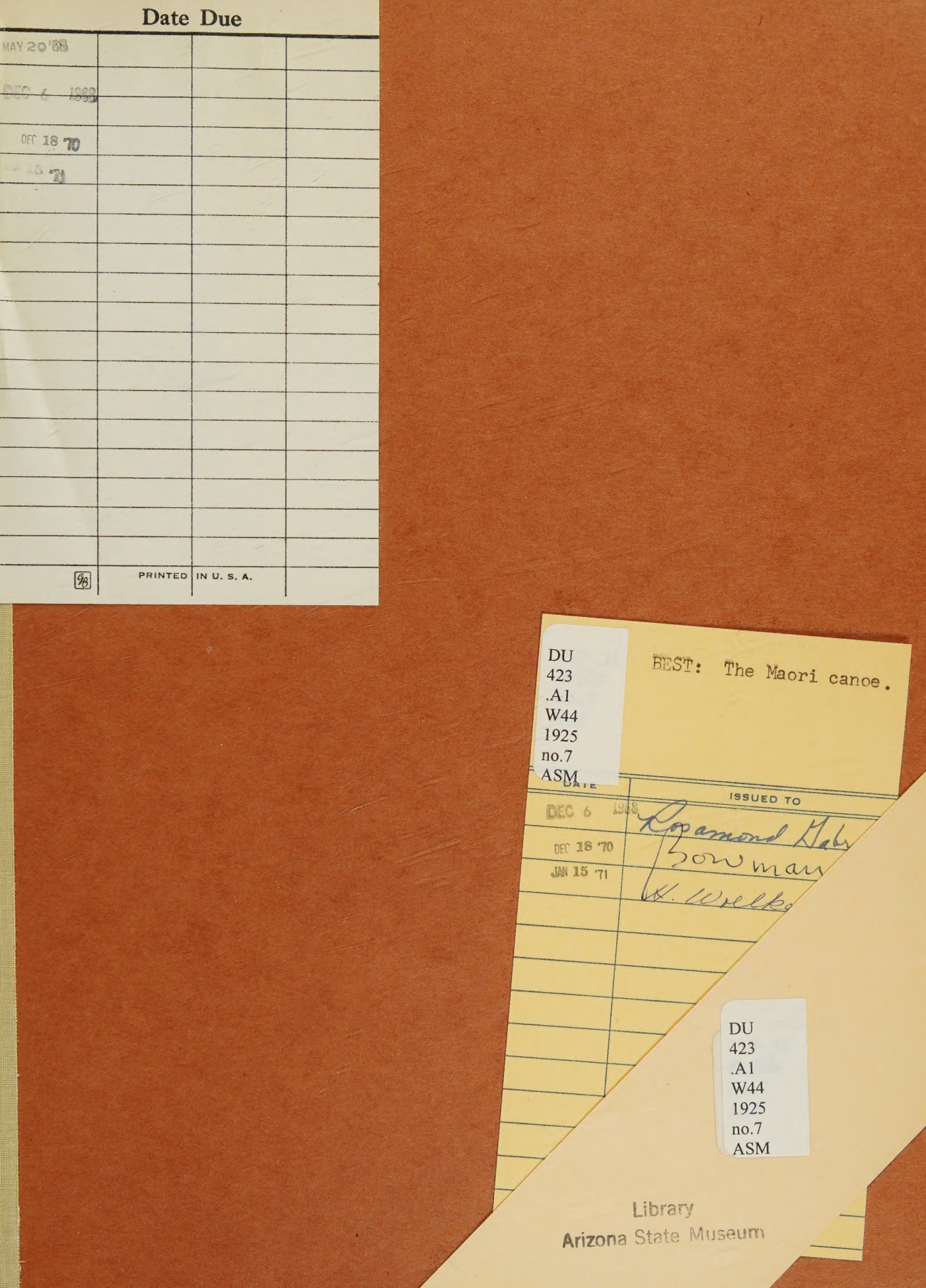
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